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Electronic Balances
TW/TX/TXB Series

Service Manual

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KYOTO JAPAN

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Precision Balance

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1. Operations for Adjustment

For the general operations method, see the User's Manual for the TW/TX/TXB Series.

1.1. ROM version information

TX ROM ver.	Ver
TX only (except TXC623)	Ver 1.XX.XX.XX
TW/TX-L all model	Ver 2.XX.XX.XX
TW/TX-N(*1) and TW/TX-L all model	Ver 3.XX.XX.XX

*1: for Japan only

1.2. Entering the Service Mode

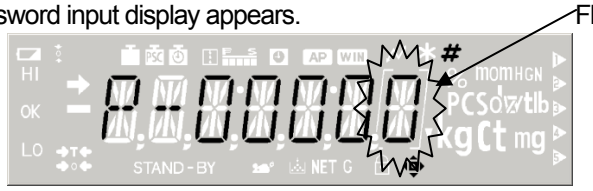
Move from user mode to service mode as follows.

(1) In the user mode mass display state, keep pressing (3-5sec.) [BREAK] and [PRINT] keys.

(2) Release the keys.

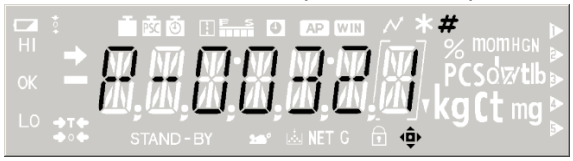
(3) Press down on the [CAL] and [->O/T<-] keys.

(4) The password input display appears.

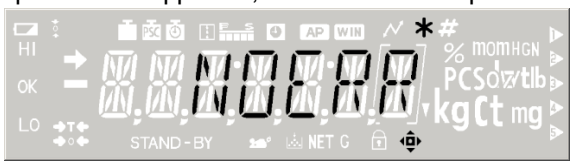


Use the arrow keys to input numbers.

Input **00321** as the maintenance mode password, and press the [MENU/Enter] key.



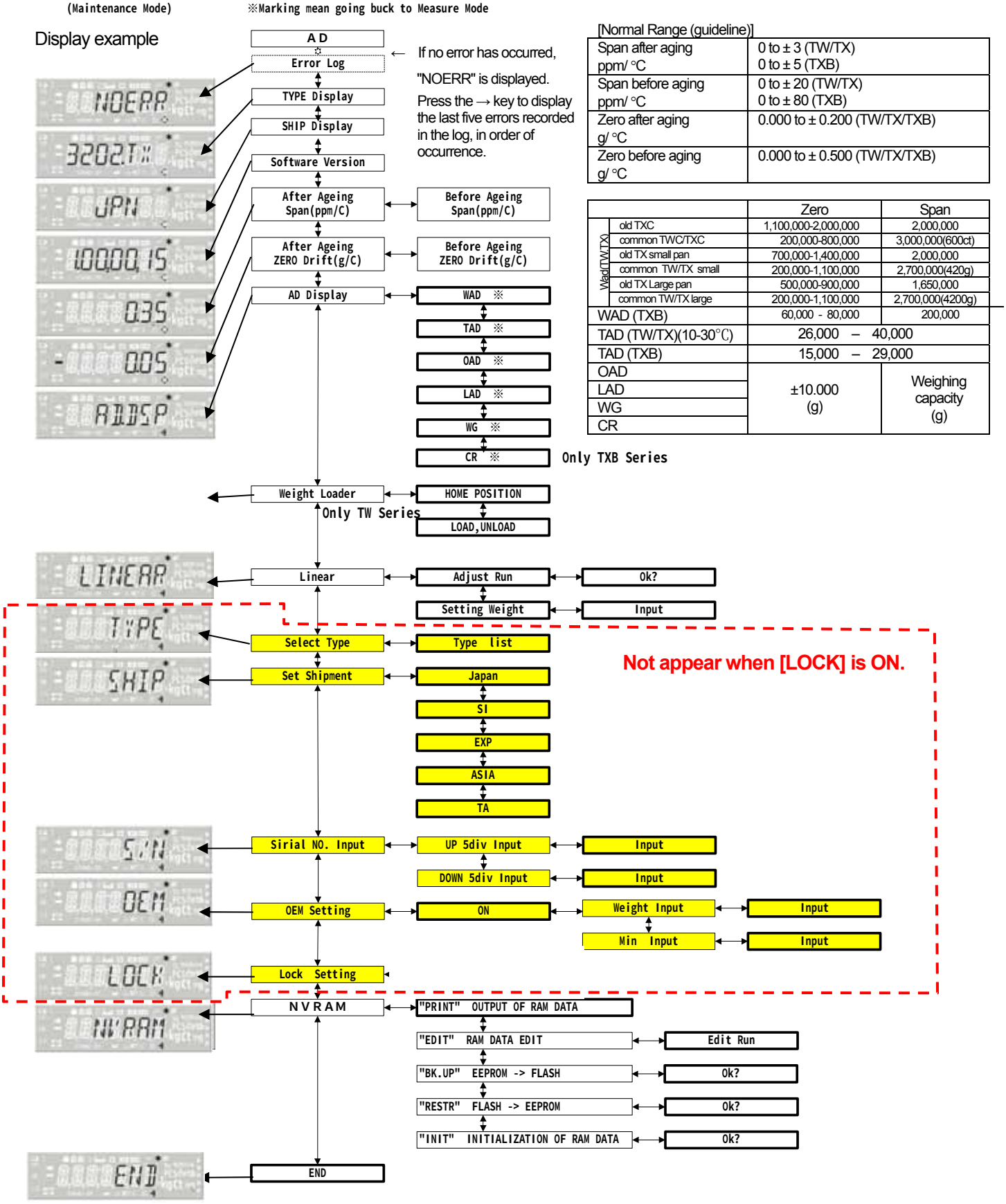
(5) When the password is approved, the service mode opens.



Alternately, you can enter service mode by inputting the maintenance mode command "@SVC=321" from the PC.

1.3. Contents of Service Menu

The service mode configuration (menu configuration diagram) is shown below.



[Normal Range (guideline)]

Span after aging ppm/ ℃	0 to ± 3 (TW/TX) 0 to ± 5 (TXB)
Span before aging ppm/ ℃	0 to ± 20 (TW/TX) 0 to ± 80 (TXB)
Zero after aging g/ ℃	0.000 to ± 0.200 (TW/TX/TXB)
Zero before aging g/ ℃	0.000 to ± 0.500 (TW/TX/TXB)

		Zero	Span
Wad(TW/TX)	old TXC	1,100,000-2,000,000	2,000,000
	common TWC/TXC	200,000-800,000	3,000,000(600ct)
	old TX small pan	700,000-1,400,000	2,000,000
	common TW/TX small	200,000-1,100,000	2,700,000(420g)
	old TX Large pan	500,000-900,000	1,650,000
	common TW/TX large	200,000-1,100,000	2,700,000(4200g)
WAD (TXB)		60,000 - 80,000	200,000
TAD (TW/TX)(10-30℃)		26,000 – 40,000	
TAD (TXB)		15,000 – 29,000	
OAD		±10.000 (g)	Weighing capacity (g)
LAD			
WG			
CR			

Items in the figure framed in thick lines denote execution items, while those framed in thin lines denote menu items.

Shaded items are not displayed when the setting information lock is on. Use the arrow keys to move between items.

Key	Explanation
→	Move to an item in a subordinate menu. If the menu item to the left of the arrow has no asterisk mark and is also shaded, pressing the Enter key on that item opens a subordinate menu item. (In other words, if the higher menu accepts the Enter key even if it has no enable/disable switch, pressing the Enter key opens the subordinate menu.) To open the menu from the mass display state, use the MENU key instead of the → key.
←	Return to the item in the higher menu.
↓	Move to items in order.
↑	Move to items in reverse order.

* For the release method of setting information lock, see "5.3.1 Releasing the Setting Information Lock".

1.4. Service Mode Functions

Service mode functions are shown below.

Function		Outline
Error display		Displays error codes for errors that have occurred in user mode. If no errors have occurred when service mode is opened, the error display does not appear.
Model name display		Displays the model name setting.
Destination display		Displays the destination setting. Ex.: JPN = Japan SI = Countries and regions that recognize SI units only EXP = Overseas (excluding Southeast Asia) ASIA = Southeast Asia TA = Type Approval
Software Ver. display		Displays the currently mounted software version. Ex.: 1.00, ##, XX In principle, 1.00 is the version number for hardware changes Next, ## is the version number for manuals and other documentation changes Finally, XX is the version number for bug fixes and other minor changes
Span temperature coefficient display		Displays the span temperature coefficient for before and after aging.
Zero drift display		Displays the amount of zero drift before and after aging.
AD value display	Mass data (WAD) display	Displays mass data as received from AD converter. (Data subjected to smoothing)
	Temperature data (TAD) display	Digitally displays voltage of temperature sensor mounted on UniBloc magnet or load cell.
	Temperature-corrected mass data (OAD) display	Displays WAD mass data subjected to temperature correction. (Data subjected to smoothing)
	Linear-corrected mass data (LAD) display	Displays OAD mass data subjected to linearity correction.
	Absolute load (WG) display	Displays mass values shown in g units that are subjected to all correction processing. Displays mass values not subjected to zero setting or tare weight.
	Creep (CR) display (TXB only)	Displays WG mass data subjected to creep correction.
Sensitivity calibration		Executes sensitivity calibration using the same operation as user mode.
Weight Loader check (Only TW)	Return to initial position	Internal weight loader system returns to initial position.
	Load and Unload	Internal weight is loaded or unloaded to UNIT ASSY.
Linearity adjustment	Linearity adjustment	Executes the adjustment operation for calculation of the linearity correction coefficient.
	Weight value input for linearity adjustment	Inputs the reference weight value used for linearity adjustment.

Function		General
Model selection		Selection of the model name automatically sets the basic information for weighing capacity, minimum display, and reference mass for adjustment.
Shipping settings	Unit for Japan	Set the units users can use, depending on shipping destination. Initial setting = Unit for Japan
	SI unit	
	Overseas unit	
	Unit for Asia	
	Type Approval	
Serial No. input	Top 5 digits	Input the top 5 digits of serial No.
	Bottom 5 digits	Input the bottom 5 digits of serial No.
OEM	On	Sets to OEM model.
	Weighing capacity	Changes the weighing capacity.
	Minimum display	Changes the minimum display.
Setting information lock (error check)		Prevents changes to the model, OEM, shipping, and S/N settings. When the lock is active, all error checks are enabled.
NVRAM	Data print	Outputs data saved in EEPROM to a dedicated printer.
	Data edit	Edits data saved in EEPROM on balance display unit.
	Backup	Of the data saved in EEPROM, backs up temperature correction coefficient, linearity correction coefficient, and model setting status data to a Flash memory.
	Download	Writes to EEPROM the data backed up on Flash memory.
	All initialize	Initializes all data saved in EEPROM.
END		Ends service mode.

2. Disassembling and Assembling the Balance

2.1. TW/TX Series

2.1.1. Precautions

1) Pull the connector straight out when disconnecting. Never pull it out at a bent angle.

   *** Pulling out at a bent angle could bend the terminal pins, making it difficult to re-insert the connector.**

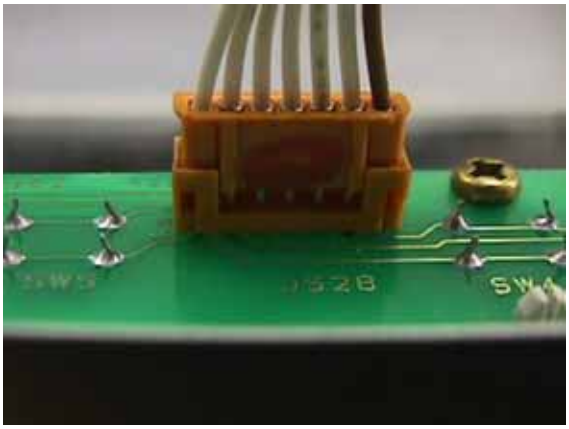


Fig. 1

2) For disassembly and assembly of the unit Assy TX(1), first insert the OPF positioning pin (J1) as far as the line set in the lever fixing hole on the OPF surface.

   *** Lift slightly on the lever Assy (U7) to insert the pin. Be careful not to scratch the elastic support.**

3) Use a controlled torque driver to tighten the screws to the torques shown in the table below.

Screw	Torque [kgf-cm]
M2	1
M2.5	2.5
M3 pan head	9
M3 hexagonal socket head	15
M4 pan head	18
M4 hexagonal socket head	30

2.1.2. Inspecting the Balance Interior (Removing the Case and Pan Support)

[Disassembly]

1) Detach the AC adaptor, then:
   [Carat/small pan only] Remove the pan (6), pan support (4), windbreak ring (7) (carat only), and sole plate (8).
   [Large pan only] Remove the pan (6), pan support cap (5), and sole plate (8).
2) [Carat/small pan only] Remove the knob (C10) on the inside of the ceiling glass set (C5), and slide the ceiling glass set (C5) backward to remove.
3) Remove the P4 M4×12 screw (22) on the back side of the balance top surface, and pull up slightly on the back side of the case Assy (3), so that it slides toward the front and separates from the base. (Fig. 2)
   *** In this condition, the main board Assy (B2), analog board Assy (B3), and power board Assy (B4) can be inspected.**

[Assembly]

1) Place the case Assy (3) over the base Assy (2) so that it catches on the front hooks, and tighten using the P4 M4×12 screw (22) on the back side of the balance top surface.
2) [Carat/small pan only] Slide in the ceiling glass set (C5) from the back of the designated grooves, and attach the inner knob (C10).
3) [Carat/small pan only] Mount the sole plate (8), windbreak ring (7) (carat only), pan support (4) and pan (6).
   [Large pan only] Mount the sole plate (8), cap (5), and pan (6). (Fig. 2)

Fig. 2

4) Use the two front caster Assys (B6) to adjust the level of the balance so that the air bubbles in the level come to the center of the framed area.
5) [Large pan only] Lower the two rear caster Assys (B6) until they contact the ground.
6) Attach the AC adaptor to the balance, and check the balance operation.
   *** When placing the case Assy (3) in position, be careful not to pinch the ILS 10S-10S-300 cable or ILS 11S-11S-440(B9) connected between Main board Assys(B2) and Power Board Assys (Fig. 3)(Including later procedure after this, photo A shows old TX and B shows TW/TX common.)**

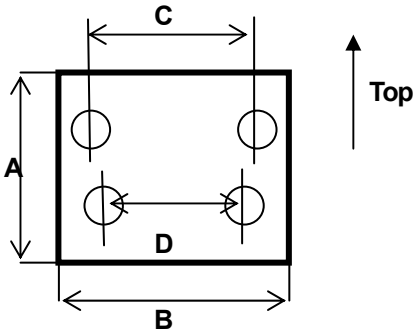
Fig. 3-A

Fig. 3-B

2.1.3. Replacing Components

2.1.3.1. Replacing the Front Glass (C8)

1) Detach the AC adaptor, and remove the pan (6), pan support (4), windbreak ring (7) (carat only), and sole plate (8).
2) Remove the knobs (C10) on the inside of the ceiling glass set (C5) and side glass sets (C6, C7) and slide the ceiling glass set (C5) and side glass sets (C6, C7) backward to remove.
3) Remove the knobs (C10) in two locations on the front.
4) **Tilt the rear surface of the case roof cover** (C4) and remove it. (Fig. 4)
5) Loosen the P4 M4×12 screw (22) holding the case roof (C3), and remove the case roof (C3).
6) Position the front glass (C8) on the back of the case (C1) front groove, and pull upward to remove the front glass (C8). (Fig. 5)
7) Follow steps 1) to 6) in reverse to attach the new front glass (C8).



Length： A < B, C > D

Fig. 4

Fig. 5

2.1.3.2. Replacing the Main Board Assy (B2)

1) Use the procedure in "2.1.2 Inspecting the Balance Interior (Removing the Case and Pan Support)" to remove as far as the case Assy (3).
2) Remove the three P4 M4×8 screws (B22) fixing the main board Assy (B2) in place. (Fig.6)

Fig.6-A

Fig.6-B

3) Disconnect the J2,J3 and J4 connectors that are connected to the main board Assy (B2).
4) Place the main board Assy (B2) in a location on the right side of the balance that is free of dirt and static electricity. (Fig. 7)
5) Remove the EEPROM located on the back side the main board Assy (B2) from the socket, taking care to avoid damaging the EEPROM feet.
6) Mount the EEPROM on the new main board Assy (B2).
7) Follow steps 1) to 3) in reverse to attach the new main board Assy (B2).

Fig.7-A

Fig.7-B

2.1.3.3. Replacing the Analog Board Assy (B3)

1) Use the same procedure as steps 1) to 3) in "2.1.3.2 Replacing the Main Board Assy (B2)" to remove as far as the main board Assy (B2).
2) [Large pan only] Loosen the two P4 M4×8 screw (22), and remove the large unit cover (9). (Fig.8)
3) [Large pan only] Insert the OPF positioning pin (J1) as far as the line set in the lever fixing hole on the OPF surface.
4) [Large pan only] Loosen the two P4 M4×14 bolt (23), and remove the large pan support Assy (4). (Fig.9)

Fig.8

Fig.9

5) Disconnect the J1,J2 and J3 connectors that are connected to the analog board Assy (B3) and loosen and remove the three P4 M4×8 screws (B22) fixing the cover plate,analog (13) . (Fig. 10)
6) Loosen and remove the two P4 M4×8 screws (B22) fixing the analog board Assy (B3) in place. (Fig. 11)

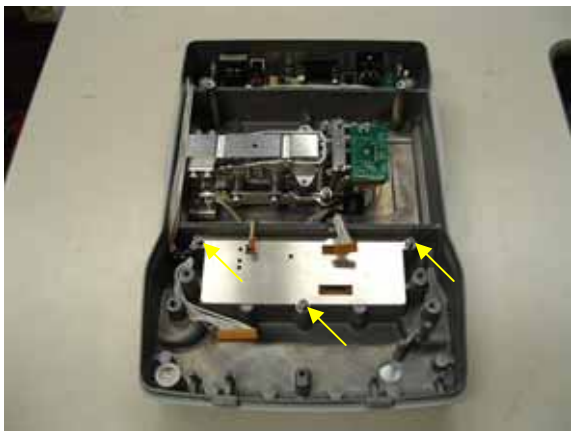


Fig.10

Fig.11

7) Follow steps 1) to 6) in reverse to attach the new analog board Assy (B3).

*** During assembly, use the CS-5 clip (B26) to securely hold the cables for Main board Assy(B2),the weight loader Assy(27) (TW only) and Unit assy,TX(1) downward so that the large pan support Assy (4) and the cables do not contact. (Fig. 12)**

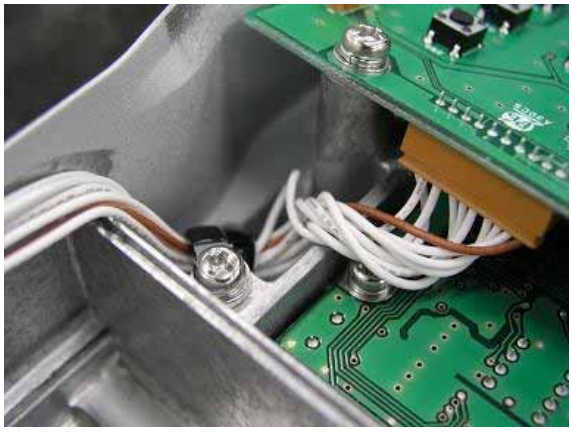


Fig.12-A

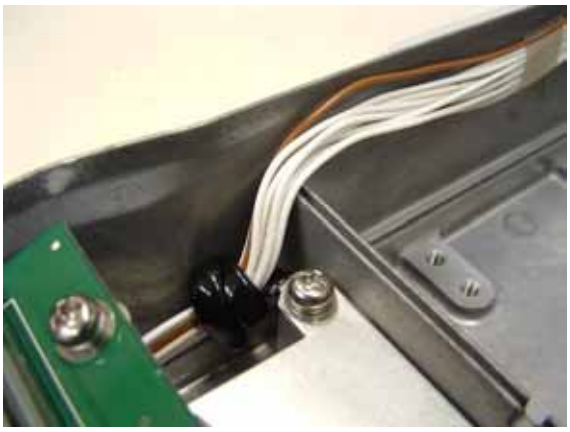


Fig.12-B1

Fig.12-B2

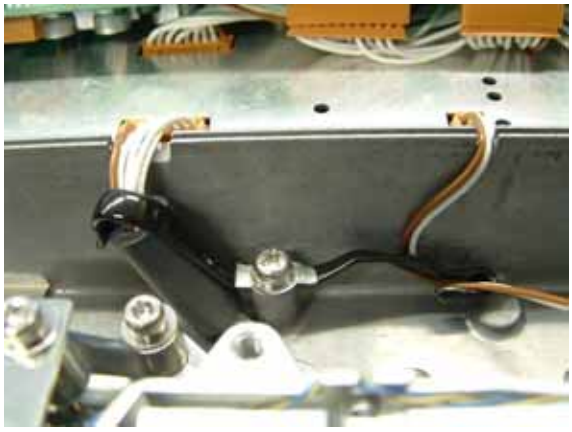


Fig.12-B3

***Attach pan support Assy (4) using Unit assy locating jig(J2) (Fig.13)**

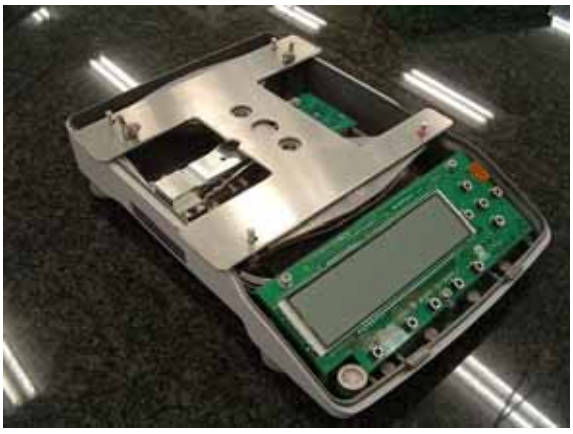


Fig.13

2.1.3.4. Replacing the Power Board Assy (B4)

1) Use the procedure in "2.1.2 Inspecting the Balance Interior (Removing the Case and Pan Support)" to remove as far as the case Assy (3).
2) [Large pan only] Loosen the two P4 M4×8 screw (22), and remove the large unit cover (9).
3) [Large pan only] Insert the OPF positioning pin (J1) as far as the line set in the lever fixing hole on the OPF surface.
4) [Large pan only] Loosen the two P4 M4×14 bolt (23), and remove the large pan support Assy (4).
5) Remove the two screws,D-sub (B25) holding the power board Assy (B4) and I/F panel (B5) in place. (Fig.14)
6) Loosen the two M3×6 button screws (B23) and remove the I/F panel (B5). (Fig. 15)

Fig.14

Fig.15

7) [Common design for TW/TX only] Open the cable clamp for ILS 11S-11S-440(B9).
8) Loosen the two P4 M4×8 screws (B22) fixing the power board Assy (B4) in place, and remove together with the CS-5 clip (B26). (Fig. 16)

*** The power board Assy (B4) can be removed by pulling upward at an angle, as shown in Fig. 17.**

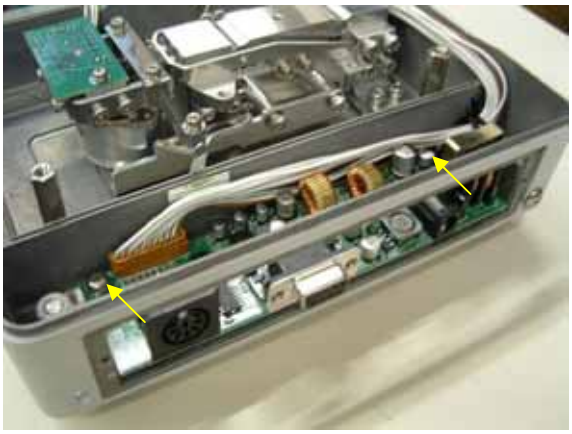


Fig.16

Fig.17

9) Disconnect the J4 connector that is connected to the power board Assy (B4).
10) Follow steps 1) to 9) in reverse to attach the new power board Assy (B4).

*** During assembly, use the cable clamp and the CS-5 clip (B26) to securely hold the cables for Power board Assy(B4) downward so that the large pan support Assy (4) and the cables do not contact. (Fig. 16 and 18)**

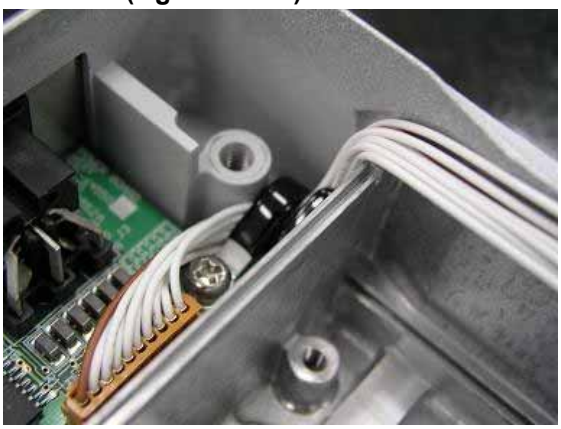


Fig.18-A

Fig.18-B

2.1.3.5. Replacing the Detector Assy (U11)

1) Use the procedure in "2.1.2 Inspecting the Balance Interior (Removing the Case and Pan Support)" to remove as far as the case Assy (3).
2) Loosen the P4 M4×8 screw (22), and remove the unit cover (9).
3) Insert the OPF positioning pin (J1) as far as the line set in the lever fixing hole on the OPF surface.
4) [Large pan only] Loosen the P4 M4×14 bolt (23), and remove the large pan support Assy (4).
5) Remove the soldering for the temperature sensor cable connected to the detector Assy (U11). (Fig. 19)
   *** TP1: Yellow wire, TP2: Blue wire**
6) Disconnect the J25 connector for the ILS-7S-7S-130 cable (U19) that is connected to the detector Assy (U11).
   *** When removing, be careful not to touch the lever Assy (U7) and scratch the elastic support.**
7) Loosen and remove the P3 M3×10 socket head bolt (U53) holding the detector Assy (U11) in place. (Fig. 20)

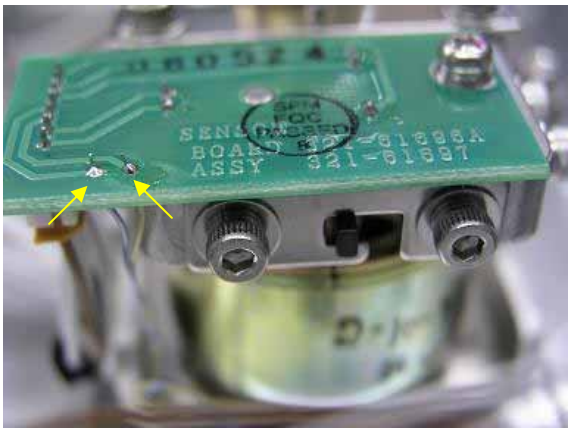


Fig.19

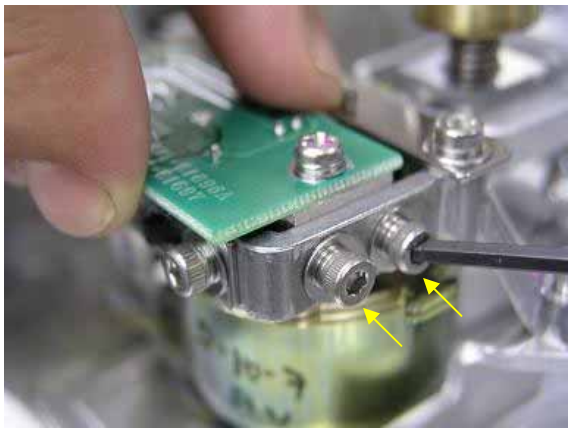


Fig.20

8) Follow steps 4) to 7) in reverse to attach the new detector Assy (U11).
9) Adjust the detector height by following "4.1.1 Adjusting the Height of the Detector Assy (U11)".
10) Follow steps 1) to 4) in reverse to restore the original status.

*** Clamp to securely hold cable,ILS 7S-7S-130(U19) with short loose length so that the Assy,Detector (U11) do not receive upward or downward force by it. (Fig. 21)**

*** [TW only] Clamp to securely hold cable,ILS 7S-7S-130(U19) and wires for the temp.sensor outside of Magnet frame so that the weight lever for Unit assy,TX (1) and the cables do not contact. (Fig. 22)**

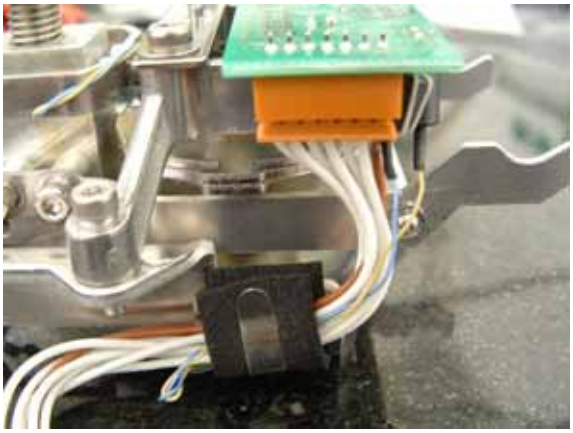


Fig.21

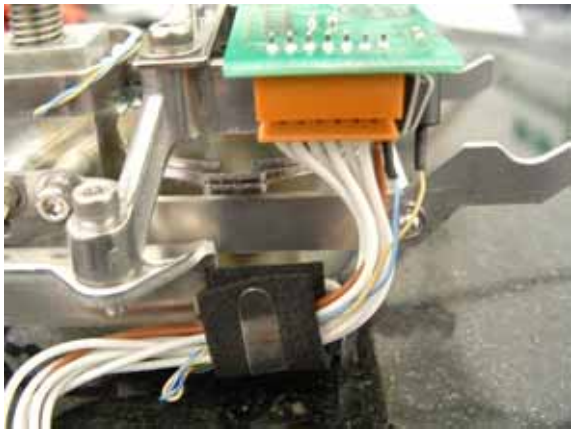


Fig.22

2.1.3.6. Replacing the TX Unit Assy (1)

1) Use the procedure in "2.1.2 Inspecting the Balance Interior (Removing the Case and Pan Support)" to remove as far as the case Assy (3).
2) [Non-CE only]Loosen the two P4 M4×8 screw (22), and remove the unit cover (9). (Fig.23)
3) Insert the OPF positioning pin (J1) as far as the line set in the lever fixing hole on the OPF surface.
4) [Large pan only] Loosen the two P4 M4×14 bolt (23), and remove the large pan support Assy (4). (Fig.24)

Fig.23

Fig.24

5) [TW only] Loosen the two P4 M3×6 screw (30), and remove the leaf supring,weight loaderr (29) and the weight(28). (Fig.25)
6) Disconnect the J2 and J3 connectors that are connected to the analog board Assy (B3).
7) Loosen and remove the four P4 M4×14 socket head bolts (23) fixing the TX unit Assy (1) in place. (Fig. 26)
*** When lifting up the TX unit Assy (1), do not grab the parallel guide or movable column.**

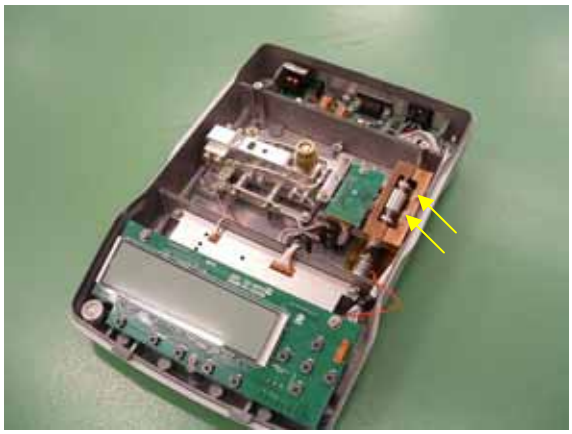


Fig.25

Fig.26

8) Follow steps 4) to 7) in reverse to attach the new TX unit Assy (1).
*** During assembly, use the CS-5 clip (B26) to securely hold the cables for Unit Assy,TX(1) downward so that the large pan support Assy (4) and the cables do not contact. (Fig. 27)**

9) Check tilt error and cornerload error by following "4.1.2 Adjusting the Tilt Error" and "4.1.3 Adjusting the Cornerload Error". Adjust them,if they are out of torelance.
10) Follow steps 1) to 3) in reverse to restore the original status.
11) Input EEPROM data of attached with Unit assy.(Refer to 4.1) Address No. 004-05A (Temp. data)

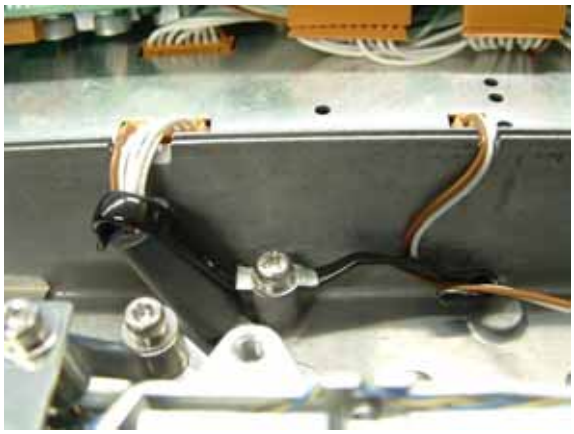


Fig.27

2.1.3.7. Replacing the Weight loader Assy (27)

1) Use the procedure in "2.1.3.6 Replacing the TX Unit Assy (1)" to remove the TX unit Assy (1).
2) Open the CS-5 clip for the cables of the weight loader assy(27) and disconnect the connector that are connected to the main board Assy (B2)
3) Loosen and remove the three P4 M3×6 screws (30) fixing the weight loader Assy (27) in place. (Fig. 28)
4) Follow steps 2) to 3) in reverse to attach the new weight loader Assy (B3)

*** During assembly, use the CS-5 clip (B26) to securely hold the cable for the weight loader Assy(27) (TW only) downward so that the large pan support Assy (4) and the cables do not contact. (Fig. 12)**

Fig.28

Fig.29

5) Attach the AC adaptor and turn on the power of balance and enter the service mode and select ”LD.ULD” and stop the arm weight loader on the lower position.
6) Insert Jig bloc,TW weight arm(J9) between the frame and the arm of weight loader Assy(27) to be the arm on the level. (fig.30)
7) Tighten the four P4 M4×14 socket head bolts (23) temporarily fixing the TX unit Assy (1) in place.
8) Set location pin,weight loader(J8) on the dint of the arm of the weight loader Assy(27) and the weight lever of the unit Assy,TX(1) and tighten the bolts for TX unit Assy(1) and screws for weight loader Assy(27) (fig.31)

Fig.30

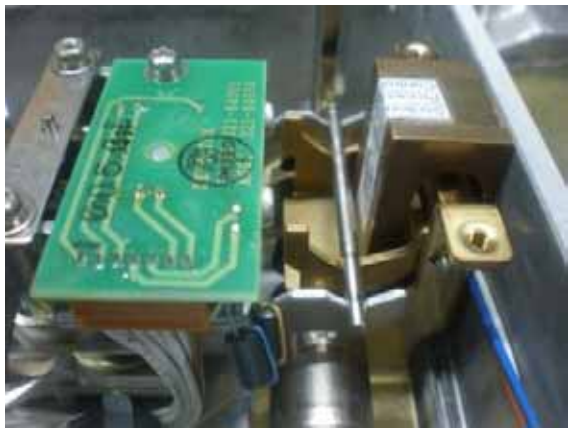


Fig.31

2.1.3.8. Replacing the Force Coil Assy (L1)

1) Use the procedure in "2.1.3.6 Replacing the TX Unit Assy (1)" to remove the TX unit Assy (1).
2) Remove the soldering on the lever Assy (U7) side of the two Pt-Ni bands (U17).
   *** Do not break or damage the PT-Ni bands.**
3) Loosen and remove the two P3 M3×14 socket head bolts (U58) fixing the detector frame (U10) in place. (Fig. 32)
4) Loosen the four M2.5×6 screws (U54) fixing the four magnet lids (U16) in place, and slide the magnet lids (U16) in the horizontal direction to remove. (Fig. 33)

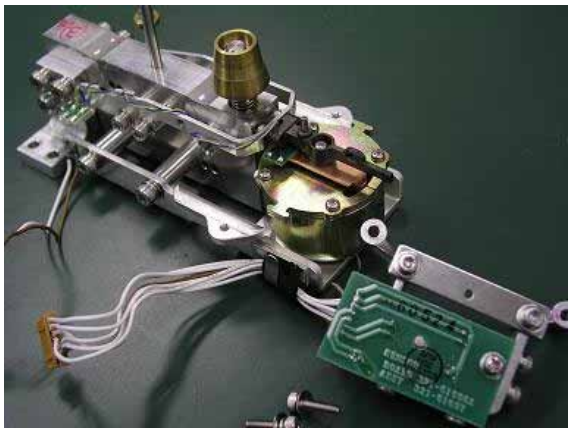


Fig. 32

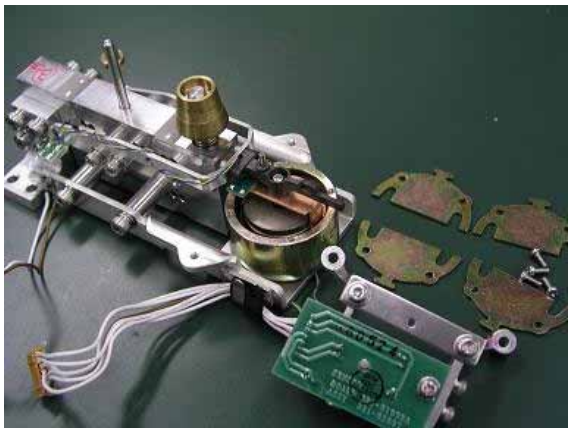


Fig. 33

5) Remove the four P3 M3×14 socket head bolts (58) fixing the lever Assy (U7) in place, and remove the lever Assy (U7) from above.
6) Remove the soldering from the twisted wire (L7) of the force coil Assy (L1) terminal board.
7) Loosen and remove the M2.5×6 screw (L5) and PB SPG M2.6 washer (L6) fixing the force coil Assy (L1) in place.
8) Use an M2.5×6 screw (L5) to temporarily fix the new force coil Assy (L1) to the lever Assy (U7), and solder the twisted wire (U7) to the force coil Assy (1). (Fig. 34)
   *** As viewed from lever Assy (U7) mounting side, Left side: Yellow wire, Right side: Blue wire**
9) Insert the lever Assy (U7) from the top of the unit, and use four P3 M3×14 socket head bolts (58) to temporarily fix it in place.
10) Pass the slit of the lever stopper (U15) attached to the detector frame (U10), and the pinhole of the stopper plate (U14), through the lever Assy (U7), and use two P3 M3×14 socket head bolts (58) to temporarily fix the frame detector (U7) in place.
11) Insert the gap setting shim (J3) between the lower edge of the lever shutter on the edge of the lever Assy (U7) and the lower edge of the slit in the lever stopper (U15), for positioning, and use four P3 M3×14 socket head bolts (58) to fix in place. (Fig. 35)
12) Remove the temporarily fixed detector frame (U7).

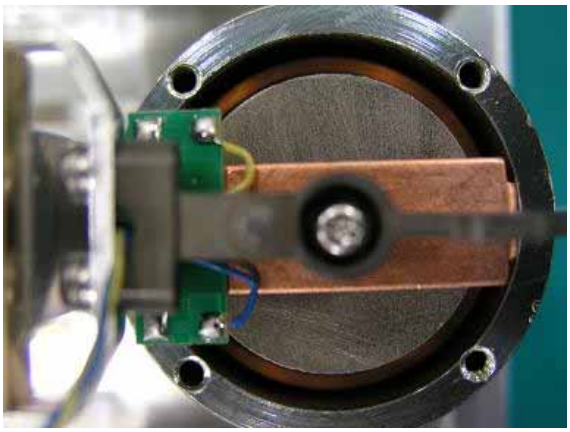


Fig. 34

Fig. 35

13) Looking at the TX unit Assy (1) from the top, tighten the force coil Assy (L1) at the position where the center of the magnet Assy (U9) aligns with the center of the force coil Assy (L1).
14) Slide in and attach the four magnet lids (U16) from the horizontal direction and use four M2.5×6 screws (U54) to tighten in place.
15) Again, pass the slit of the lever stopper (U15) attached to the detector frame (U10), and the pinhole of the stopper plate (U14), through the lever Assy (U7), and use two P3 M3×14 socket head bolts (58) to tighten the frame detector (U7) in place.
16) Solder the lever Assy (U7) side of the two Pt-Ni bands (U17).
    *** When soldering, do not twist or break the Pt-Ni bands.**
17) Adjust the stopper plate (U14) to a position aligned with the center of the lever Assy (U7) pin, and use an M3×6 socket head bolt (U57) and M3 washer (U56) to tighten.(Fig. 36)
18) Remove the OPF positioning pin (J1) from the TX unit Assy (1), then gently shake the TX unit Assy (1) to check that the lever Assy (U7) moves smoothly up and down and that a clear sound is heard when it strikes the lever stopper (U15). If it does, assembly of the TX unit Assy (1) is complete.
19) Follow steps 4) to 6) of "2.1.3.6 Replacing the TX Unit Assy (1)" in reverse to attach the new TX unit Assy (1).
20) Adjust tilt error and cornerload error by following "4.1.2 Adjusting the Tilt Error" and "4.1.3 Adjusting the Cornerload Error".
21) Follow steps 1) to 3) of "2.1.3.6 Replacing the TX Unit Assy (1)" in reverse to restore the original status.

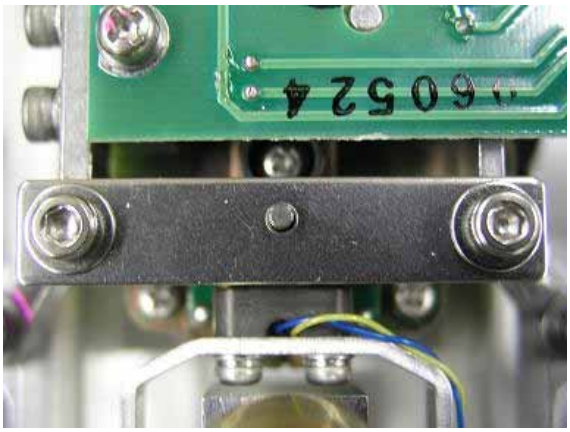


Fig. 36

2.2. TXB Series

2.2.1. Precautions

1) Pull the connector straight out when disconnecting. Never pull it out at a bent angle.

*** Pulling out at a bent angle could bend the terminal pins, making it difficult to re-insert the connector.**

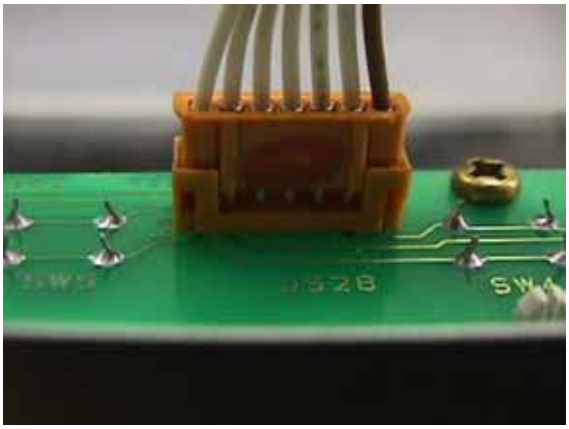


Fig. 1

2) When handling the load cell Assy, be careful not to apply excessive force.

*** The cell could be damaged.**

3) Use a controlled torque driver to tighten the screws to the torques shown in the table below.

Screw	Torque [kgf-cm]
M2	1
M2.5	2.5
M3 pan head	9
M3 hexagonal socket head	15
M4 pan head	18
M4 hexagonal socket head	30

2.2.2. Inspecting the Balance Interior (Removing the Case and Pan Support)

[Disassembly]

1) Detach the AC adaptor, and remove the pan (1), pan support (2), and windbreak ring (3). To remove the windbreak ring (3), rotate it clockwise as viewed from above.

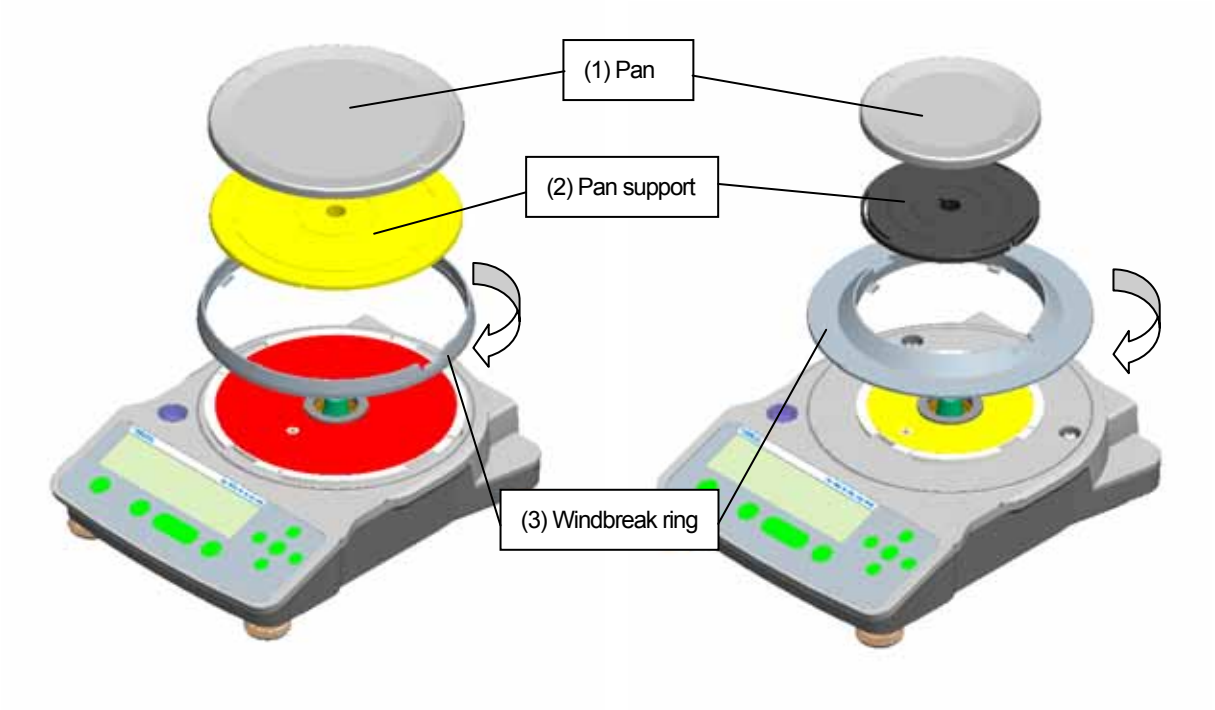


Fig. 1 Large Pan Model

Fig. 2 Small Pan Model

2) Remove the two M4×10 pan head screws (21), and remove the metal plate (4) and ring spacer (5). Then, remove the two M4×8 sems screws (22).

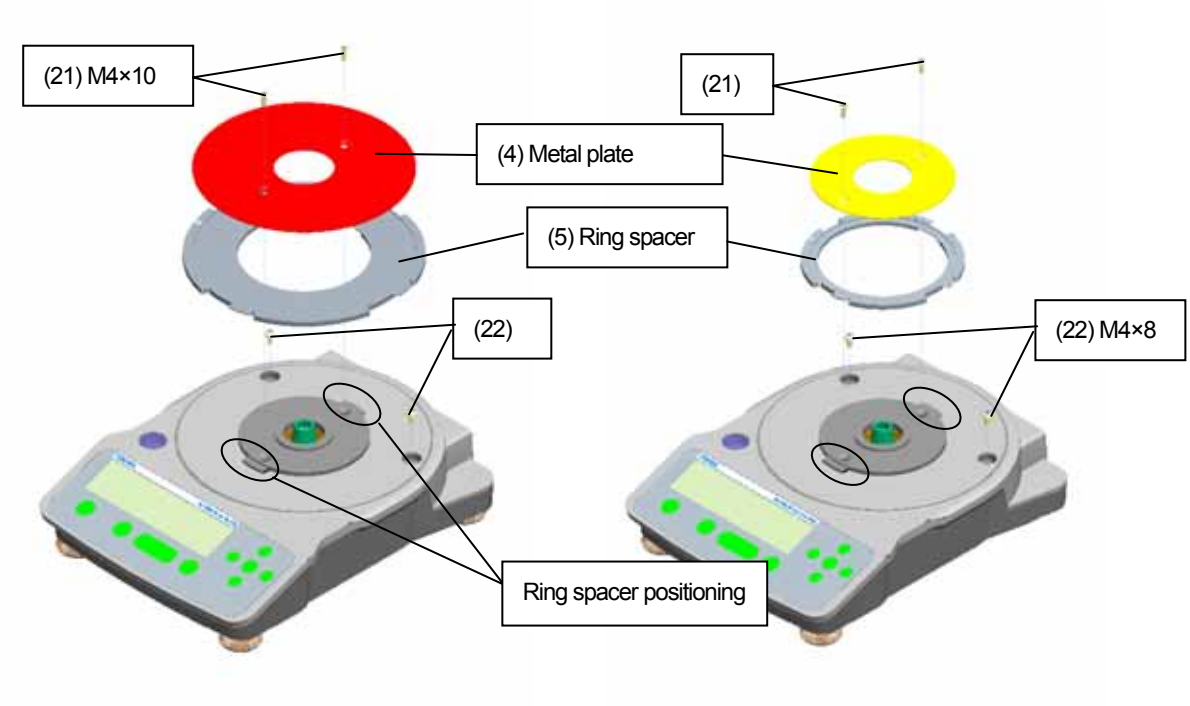


Fig. 3 Large Pan Model

Fig. 4 Small Pan Model

3) Lift up the upper case (6) from the back, and disengage from the hooks at the front of the lower case (7).

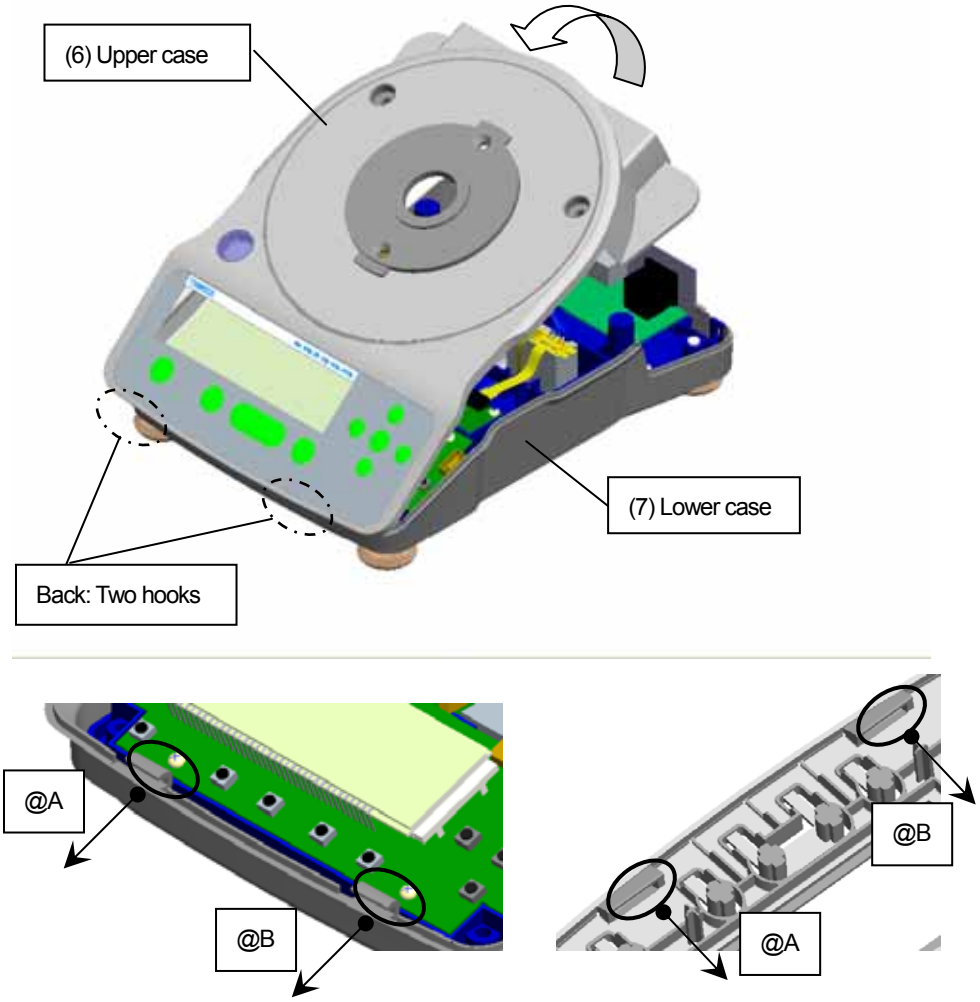


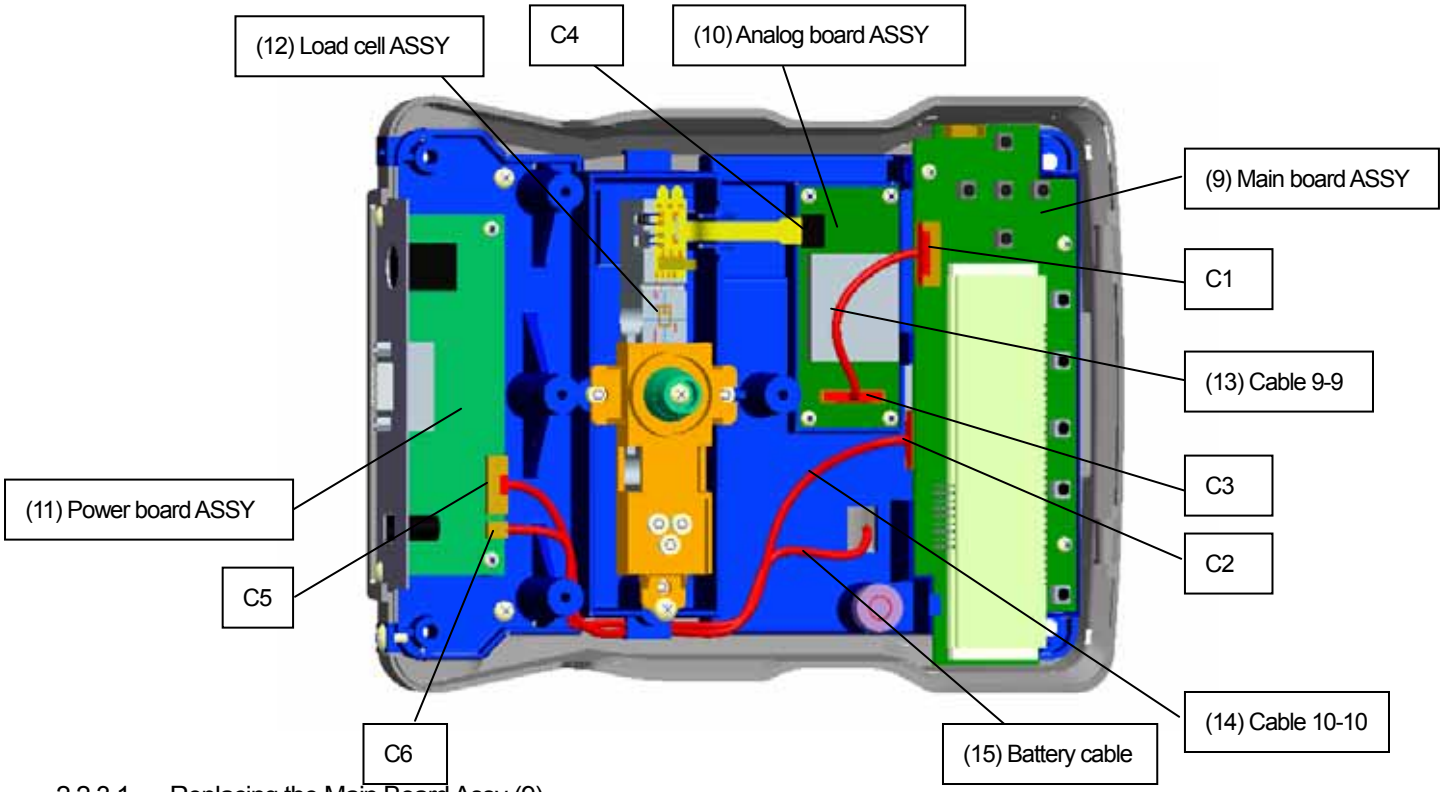
Fig. 5 Removing the Upper Case

*** In this condition, the main board Assy (B1), analog board Assy (B2), and power board Assy (B3) can be inspected.**

[Assembly]

1) See Fig. 5 to insert the two slits on the front of the upper case (6) into the lower case (7) hooks, and cover the back of the upper case (6) over the lower case (7).
2) Attach M4×8 sems screws (22) in two locations.
3) Mount the ring spacer (5) to align with the upper case (6) ring spacer positioning projection.
   From above, align the metal plate (4) with the pan head screw hole on the ring spacer (5), and attach the M4×10 pan head screw (21).
4) Attach the windbreak ring (3), pan support (2), and pan (1), in that order.
5) Use the two front level adjustment feet (8) to adjust the level of the balance so that the air bubbles in the level come to the center of the framed area.
6) [Large pan only] Lower the two rear level adjustment feet (8) until they contact the ground.
7) Attach the AC adaptor to the balance, and check the balance operation.

2.2.3. Replacing Components



2.2.3.1. Replacing the Main Board Assy (9)

1) Use the procedure in "2.2.2 Inspecting the Balance Interior (Removing the Case and Pan Support)" to remove as far as the upper case (6).
2) Disconnect the connector (C1) for cable 9-9 (13) and the connector (C2) for cable 10-10 (14) that are connected to the main board Assy (9).
3) Remove the three P4 M4×8 screws (23) fixing the main board Assy (9) in place.
4) Place the main board (9) in a location that is free of dirt and static electricity.
5) Remove the EEPROM located on the back side the main board Assy (9) from the socket, taking care to avoid damaging the EEPROM feet.
6) Mount the EEPROM on the new main board Assy (9).
7) Follow steps 1) to 3) in reverse to attach the new main board Assy (9).

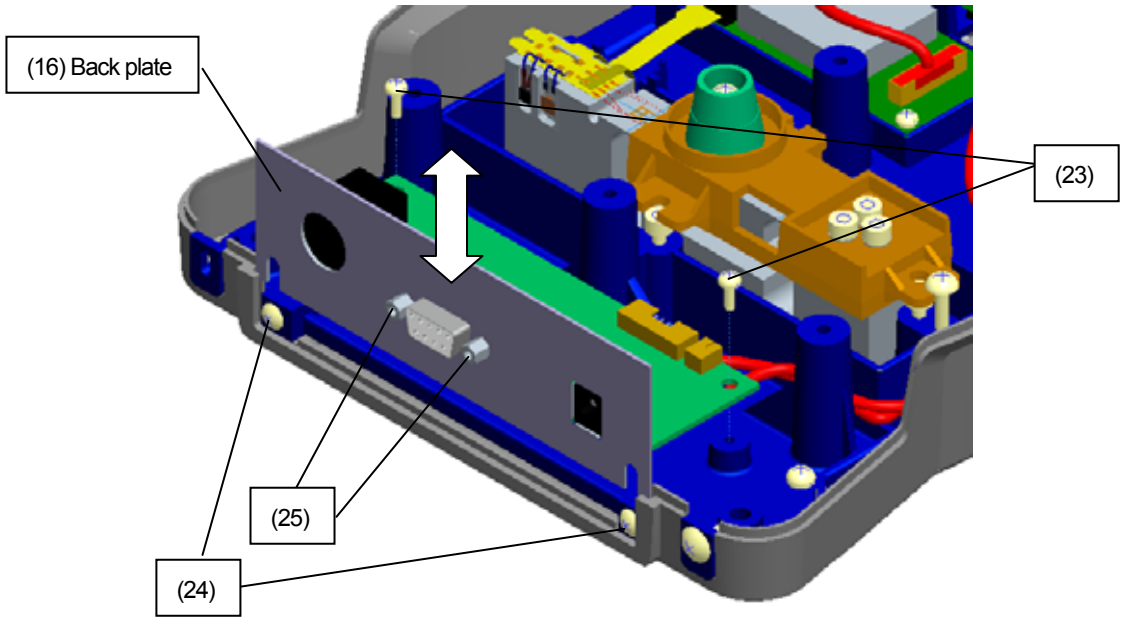
2.2.3.2. Replacing the Analog Board Assy (10)

1) Use the procedure in "2.2.2 Inspecting the Balance Interior (Removing the Case and Pan Support)" to remove as far as the upper case Assy (6).
2) Disconnect the connector (C3) for cable 9-9 (13) that is connected to the analog board Assy (10).
3) Remove the cell Assy (12) flexible board (C4).
   *** Be careful not to damage the cell Assy.**
4) Loosen and remove the four P4 M3×8 screws (23) fixing the analog board Assy (10) in place.
5) Follow steps 1) to 6) in reverse to attach the new analog board Assy (10).

2.2.3.3. Replacing the Power Board Assy (11)

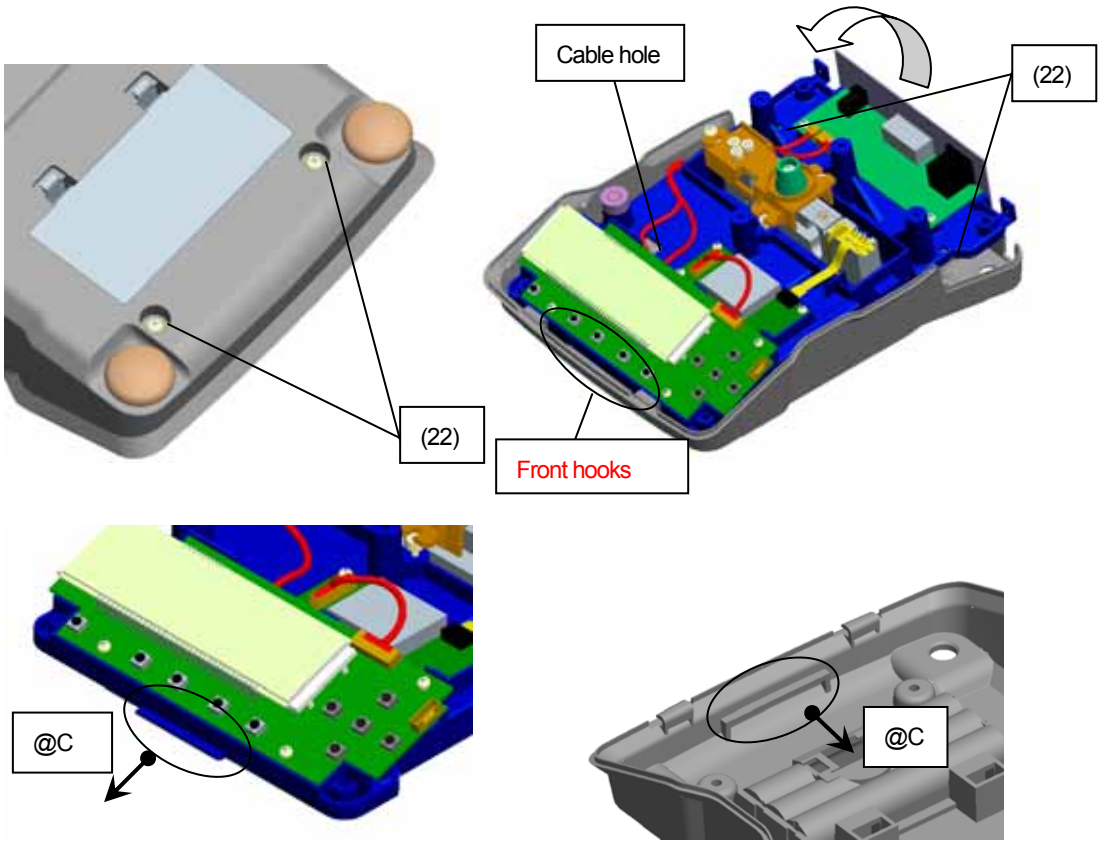
1) Use the procedure in "2.2.2 Inspecting the Balance Interior (Removing the Case and Pan Support)" to remove as far as the upper case Assy (6).
2) Disconnect the connector (C5) for cable 10-10 (14), and the connector (C6) for the battery cable (15) that are connected to the power board Assy (11).
3) Loosen the two M3×6 truss screws (25) fixing the back plate (16) in place.
4) Remove the two M3×8 sems screws (23) fixing the power board Assy (11) in place.
5) Slide the back plate (16) upward, and remove the back plate (16) and power board Assy (11).

6) Remove the two CDHWE101S00 screws (24) fixing the power board Assy (11) and back plate (16) in place.
7) Temporarily tighten the two CDHWE101S00 screws (24) fixing the new power board Assy (11) and back plate (16) in place.
8) Slide the back plate (16) down, and set the back plate (16) so that it is held down by the M3×6 truss screw (25).
9) Use two M3×8 sems screws (23) to fix the power board Assy (11) in place.
10) Use two M3×6 truss screws (25) to fix the back plate (16) in place.
11) Tighten the two loosely tightened CDHWE101S00 screws (24).
12) Disconnect the connector for cable ILS 10S-10S-270 (B9) that is connected to the power board Assy (B4).
13) Insert the connector (C5) for cable 10-10 (14) and the connector (C6) for the battery cable (15).



2.2.3.4. Replacing the Load Cell Assy (12)

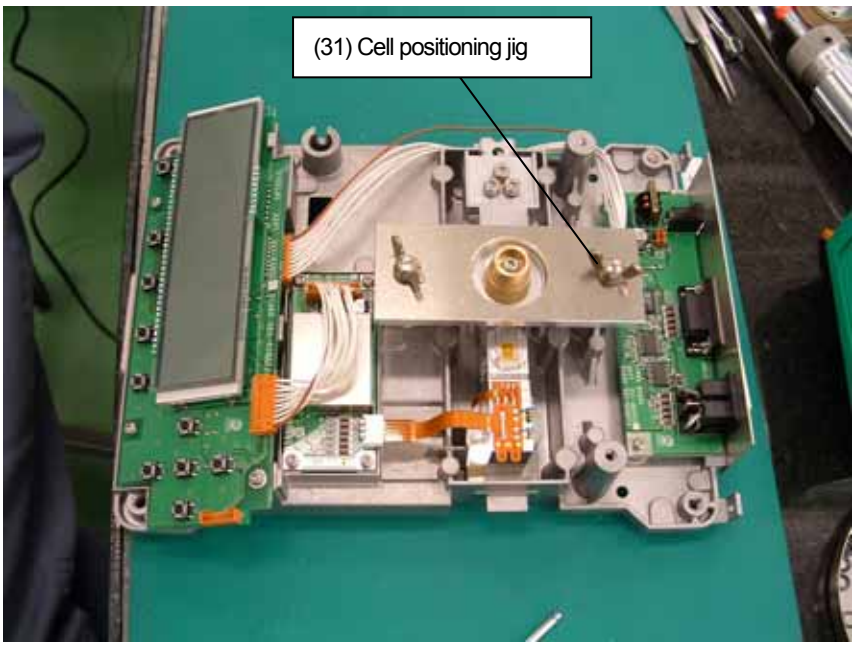
1) Use the procedure in "2.2.2 Inspecting the Balance Interior (Removing the Case and Pan Support)" to remove as far as the upper case Assy (6).
2) Disconnect the connector (C6) for the battery cable (15).
3) Remove the four level adjustment feet (8) on the back of the main body (for the large pan model; the small pan model has two feet), and the two M4×8 sems screws (22).
   *** Be careful not to apply force to the load cell Assy.**
4) Remove the two M4×8 sems screws (22) fixing the base Assy (17) in place.
5) While removing the connector (C6) from the base Assy (17) hole, lift up the back plate (16) to remove the base Assy (17).



6) Remove the hexagonal socket head bolt on the back of the base Assy (17).
*** Be careful not to apply force to the load cell Assy. Also be careful not to drop the load cell Assy.**

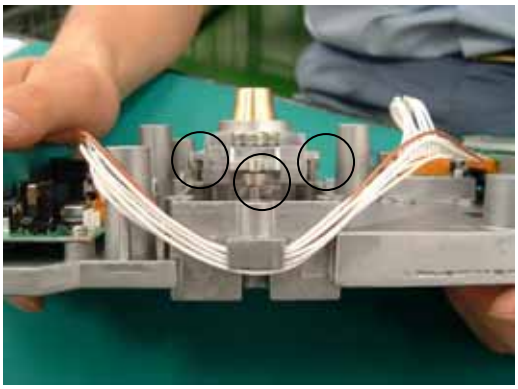
7) Follow steps 2) to 5) in reverse to attach the new load cell Assy (12).

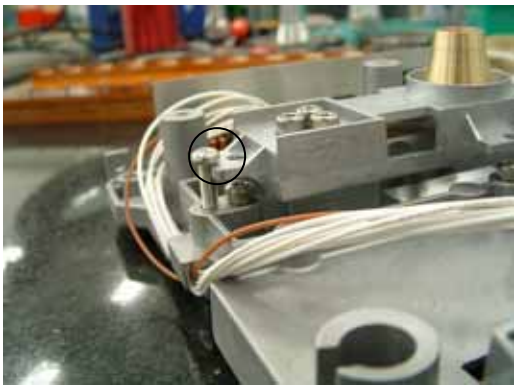
8) While positioning the load cell Assy with the jig (31), use the hexagonal socket head bolt to attach the load cell Assy (12).



9) Adjust the four displacement stop screws for the load cell Assy. Raise the screws until they touch the pan support projection, and then lower them by turning backward by 270 degrees. Confirm that the gap jig t=0.4 (32) can be inserted but the gap jig t=0.6 (32) cannot be inserted. Use Loktite (26) to fix the screws in place.

Adjustment range: 0.5 mm





10) Input EEPROM data of attached with load cell assy. (Refer to 4.2)

Address No. 004-05A (Temp. data) and No. 14A-158 (Creep coefficient data. TXB only)

3. Checking the Electronic Board

3.1. TW/TX Series

The TW/TX Series boards and their signal allocations are summarized below. Numbers in parenthesis ((1), (2), (3), and so on) show pin numbers, and a checkmark (✓) indicates a point that needs checking, if possible.

3.1.1. Main Board Assy (B2)

Assy P/N		321-64553-03(TW/TWC, TX/TXC common), -01(TX, TXC323L), -14(TXC623L)
Board P/N		321-64555
Circuits Mounted		CPU (Metric data calculation, LCD control, key switch control) EEPROM, connector (J1) for Flash memory writing Main clock (20 MHz), generates +5 V for logics Motor driver for weight loader

3.1.2. Analog Board Assy (B3)

Assy P/N		321-64556-11 (TW/TX small pan), -12 (TW/TX large pan), -14 (TWC/TXC)	
Board P/N		321-64558	
Circuits Mounted		Mechanical sensor PID control (feedback) Measurement system (A/D converter) circuit and reference power generation circuit Magnet temperature correction and measurement circuit	
Check Voltage (connecting Assy, Detector)		TPG	Signal GND (0 V)
	✓	TP1	Pre-amp control signal output; 0 V at feedback
		TP2	Coil current control voltage
	✓	TP3	Output resistance terminal voltage (approx. 0.6 to 2.3 V)
	✓	J2 (1)	Beam sensor light emission diode positive voltage approx –5.2 V
	✓	J2 (2)	Beam sensor light emission diode negative voltage approx –6.8 V
	✓	J2 (3)	Magnet temperature sensor output voltage approx. 0.6 V
		J2 (4)	Signal GND (0 V)
		J2 (5)	Beam sensor reception diode output; 0 V at feedback
		J2 (6)	Signal GND (0 V)
		J2 (7)	Beam sensor reception diode output; 0 V at feedback
		J1 (1)	Signal GND (0 V)
	✓	J1 (2)	Analog system power approx. -12 V
	✓	J1 (3)	Analog system power approx. +12 V
		J1 (4)	Temperature A/D digital signal
		J1 (5)	Temperature A/D digital signal
		J1 (6)	Weight A/D digital signal
		J1 (7)	Weight A/D digital signal
		J1 (8)	Weight A/D digital signal
		J1 (9)	Weight A/D digital signal

3.1.3. Power Board Assy (B4)

Assy P/N		321-64550	
Board P/N		321-64552	
Circuits Mounted		Smoothes out AC adaptor input (DC 12 V/1 A), generates ±12 V and +5 V for communications DATA I/O and RS-232C communications	
Check Voltage		J4 (1)	Signal GND (0 V)
		J4 (2)	Signal GND (0 V)
	✓	J4 (3)	Supplies power to other circuits, approx. +12 V
	✓	J4 (4)	Supplies power to other circuits, approx. -12 V
		J4 (5)	AC adaptor (external battery) power check voltage approx. +3.8 V
		J4 (6)	DTR signal
		J4 (7)	TXD signal
		J4 (8)	RXD signal
		J4 (9)	DSR signal
		J4 (10)	DTR/P signal
	✓	J4 (11)	Supplies power to other circuits, approx. +12 V

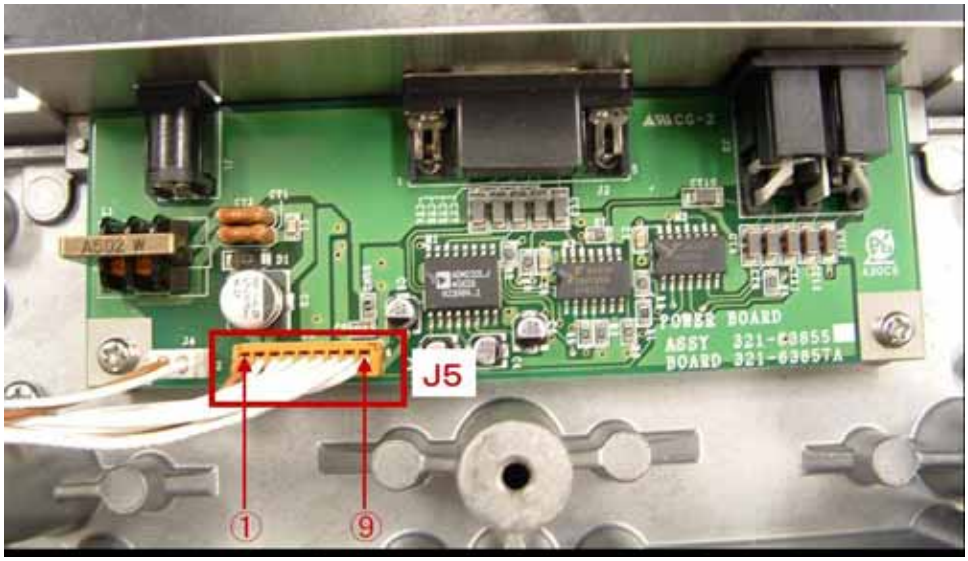
3.2. TXB Series

The TXB Series boards and their signal allocations are summarized below. Numbers in parenthesis ((1), (2), (3), and so on) show pin numbers, and a checkmark (✓) indicates a point that needs checking, if possible.

.

3.2.1. Power Board Assy

Assy P/N		321-63855
Board P/N		321-63857
Circuits Mounted		Smoothes out AC adaptor and dry battery input (DC 12 V/1A, DC 9 V) DATA I/O and RS-232C communications +5 V for logics is generated by Display board.
Check Voltage	✓	J5 (1) Signal VIC(+12 V)
	✓	J5 (2) Signal GND (0 V)
		J5 (3) TXD signal
		J5 (4) DTR signal
		J5 (5) RXD signal
		J5 (6) DSR signal
		J5 (7) DTR/P signal
	✓	J5 (8) Signal DVCC (+5 V)
	✓	J5 (9) Signal DGND (0 V)

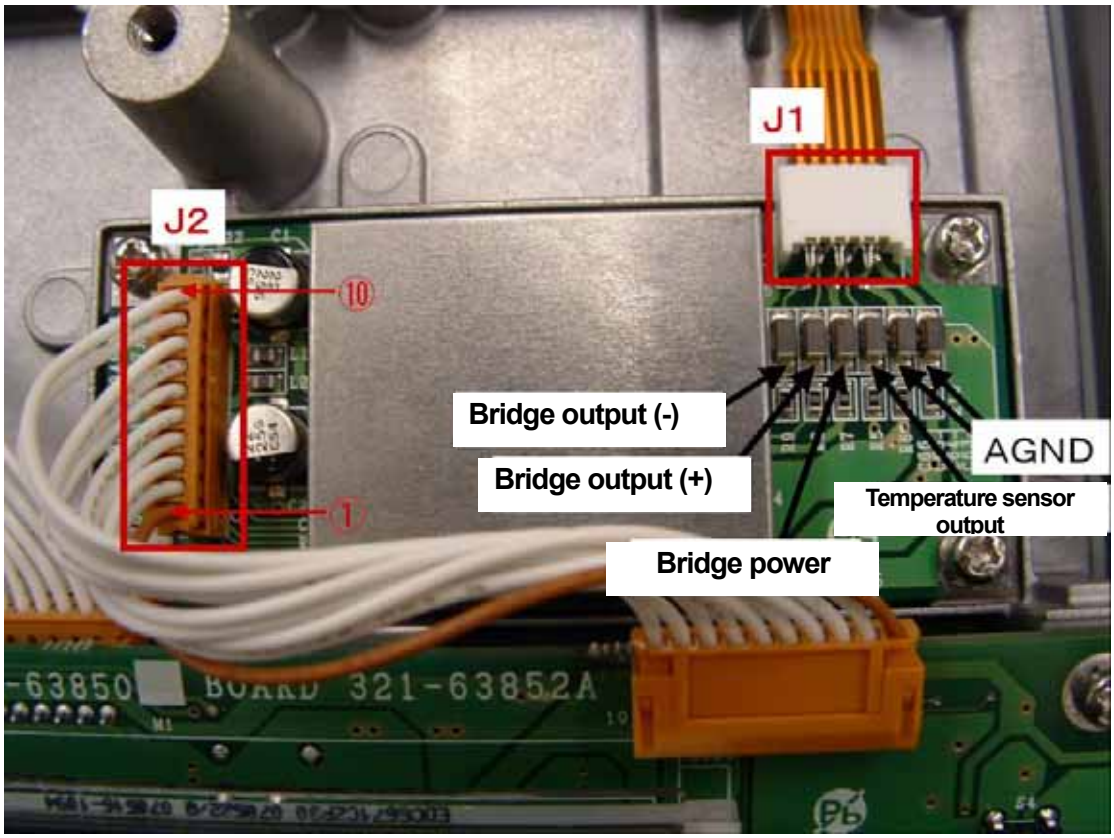


3.2.2. Display Board Assy

Assy P/N		321-63850
Board P/N		321-63852
Circuits Mounted		CPU (Metric data calculation, LCD, key switch, and back light control) EEPROM, connector (J3) for Flash memory writing Main clock (20 MHz) A/D conversion for temperature sensor output Generates +5 V for logics (Also supplied to Power and Analog boards)

3.2.3. Analog Board Assy

Assy P/N		321-63845	
Board P/N		321-63847	
Circuits Mounted		A/D converter, generates analog +5 V Temperature sensor output amplification +5 V for logics is generated by Display board.	
Check Voltage	✓	J1 (1) Signal AGND (0 V): A/DC reference (-), bridge power (-)	Between (1)-(4) Approx 420 ohm
		J1 (2) Signal AGND (0 V)	
		J1 (3) Temperature sensor output (0.57 to 0.67 V)	
	✓	J1 (4) Signal AVCC (+5 V): A/DC reference (+), bridge power (+)	
	✓	J1 (5) Bridge output (+)	Zero to 6 mV between (5)-(6) approx 350 ohm **Remove "J1" cable when checking ohm.**
	✓	J1 (6) Bridge output (-)	
		J2 (1) RESET signal	
		J2 (2) RDY signal	
		J2 (3) DOUT signal	
		J2 (4) DIN signal	
		J2 (5) SCLK signal	
	✓	J2 (6) Signal DVCC (+5 V)	
	✓	J2 (7) Signal DGND (0 V)	
		J2 (8) Signal DGND (0 V)	
	✓	J2 (9) Signal VCC (+12 V)	
	✓	J2 (10) Temperature sensor output after amplification (1.02 to 2.87 V)	



4. Hardware Adjustment

4.1. TW/TX Series

When replacing the following components, balance performance may be altered. After replacement, check the performance and make adjustments if necessary.

Adjustments required \ Service		Unit Assy replace-ment	Force coil Assy replace-ment	Detector Assy replace-ment	Analog board Assy replace-ment	Main board Assy replace-ment	Weight loader Assy replace-ment	ROM Version Up	Cornerload error adjustment	Tools required
	Reference	2.1.3.6	2.1.3.7	2.1.3.5	2.1.3.3	2.1.3.2	2.1.3.7	7.2	4.1.3	
1	Detector Assy height adjustment 4.1.1			✓						Digital Multi–meter (DC +/-5 V) Check wire set
2	Tilt error adjustment 4.1.2		✓	✓						
3	SPAN Temerature coef Write 6.2	✓ *2)				✓ *1)				
4	Linearity adjustment 5.5	✓	✓	✓	✓				✓	Standard weight
5	Calibration (*4) (P-CAL) 5.6	✓	✓	✓	✓				✓	Standard weight
6	Calibration (I-CAL/E-CAL) 5.7	✓	✓	✓	✓		✓		✓	Standard weight
7	Error log reset *3) 6.2	✓	✓	✓	✓	✓	✓	✓	✓	
8	EEPROM Data Backup 6.3	✓	✓	✓	✓	✓	✓	✓	✓	

*1) When the main board Assy (B2) has been replaced, mount the EEPROM from the previous main board Assy (B2).

*2) When the TX unit Assy (1) has been replaced, input the attached EEPROM data (**Address No. 004 – 05A**).

*3) All of the EEPROM data of **address No. 288 – 28D** are set to “0”(zero).

*4) TW series only

4.1.1. Adjusting the Height of the Detector Assy (U11)

1) With the ILS 2S-90 cable (U20) connector that is connected to the analog board Assy (B3) disconnected, attach the AC adaptor and turn on the power.
2) Connect the tester terminals to the analog board Assy (B3) TP1 (+) and TPG (-).
3) Slightly loosen the P3 M3×10 socket head bolt (U53) tightening the detector Assy (U11), then lightly raise or lower the lever Assy (U7) until it contacts the lever stoppers (U15). Adjust the height of the detector Assy (U11) so that the tester display changes between positive and negative values within a range of ±25%.
   * **If the digital multimeter display stays negative (-) when the lever Assy (U7) is raised or lowered, lower the detector Assy (U11). If it stays positive (+), raise the detector Assy (U11).**
4) If adjustment is successful, tighten the P3 M3×10 socket head bolt (U53). (Fig. 37)
5) Disconnect the tester terminals from the TP1 and TPG pins of the analog board Assy (B3).
6) Detach the AC adaptor, and connect the ILS 2S-90 cable (U20) connector to the analog board Assy (B3).

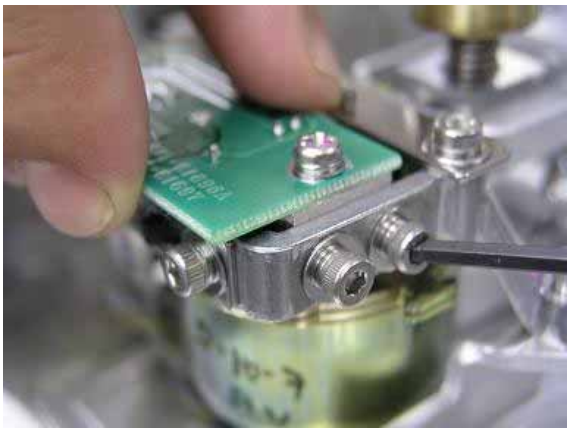


Fig. 37

4.1.2. Adjusting the Tilt Error

1) Use the procedure in "2.1.2 Inspecting the Balance Interior (Removing the Case and Pan Support)" to remove as far as the case Assy (3).
2) Use the two front caster Assys (B6) to adjust the level of the balance so that the air bubbles in the level come to the center of the framed area.
3) [Large pan only] Lower the two rear caster Assys (B6) until they contact the ground.
4) Attach the pan (6), pan support cap (5), and pan support (4), then attach the AC adaptor and turn on the power.
5) Press any key to change to the "g" display, insert a 1 mm thick plate under the right front foot of the balance, and read the display. (Fig. 38)
6) If the display is outside the adjustment criteria, detach the AC adaptor, insert the OPF positioning pin (J1) as far as the line set in the lever fixing hole on the OPF surface, and loosen the M3 nut (L9).
7) If the display shows a positive value, rotate the lever Assy (U7) P4 M3×25 screw (L12) clockwise. If the display shows a negative value, rotate it counterclockwise.
8) Remove the OPF positioning pin (J1), attach the AC adaptor, and turn on the power.
9) Repeat steps 5) to 8) until adjustment is successful. Use the M3 nut (L9) to lock the P4 M3×25 screw (L12) in place. (Fig. 39)

*** Before adjusting the lever Assy (U7) screw and nut, detach the AC adaptor and insert the OPF positioning pin (J1) into the OPF.**

Fig. 38

Fig. 39

4.1.3. Adjusting the Cornerload Error

*** This adjustment is only effective for minor errors (within ±30 counts).**
If the error is larger, replace the TX unit Assy (1).

1) Use the procedure in "2.1.2 Inspecting the Balance Interior (Removing the Case and Pan Support)" to remove as far as the case Assy (3).
2) Use the two front caster Assys (B6) to adjust the level of the balance so that the air bubbles in the level come to the center of the framed area.
3) [Large pan only] Lower the two rear caster Assys (B6) until they contact the ground.
4) Attach the pan (6), pan support cap (5), and pan support (4), then attach the AC adaptor and turn on the power.
5) Press any key to change to the "g" display.
6) Place the following adjustment weight on the pan (6), and press the [->0/T<-] key to change to the "0g" display.

Model	Weight
TWC/TXC323L (Carat)	30[g]
TWC/TXC623L (Carat)	50[g]
TW/TX (Small pan)	150 [g]
TW/TX (Large pan)	1,500 [g]

7) First place the weight on the pan center (position 1 in Fig. 40). Then move the weight in the order of 2 → 3 → 4 → 5 → 1, while recording the display at each position.
8) Use the cornerload adjustment tools (J4, J5) to cut the strain generator of the parallel guide corresponding to the position where a **positive (+) value** was displayed. (Fig. 41)
9) Repeat steps 7) and 8) until the result falls within the adjustment criteria.

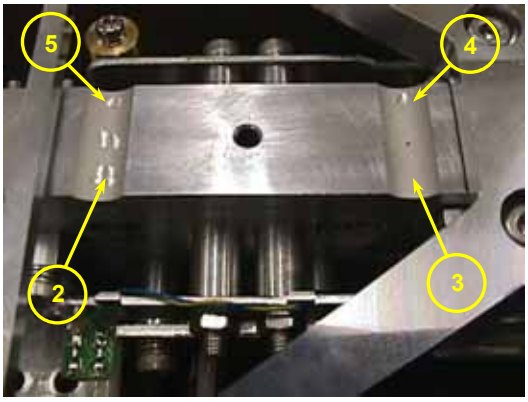


Fig. 40

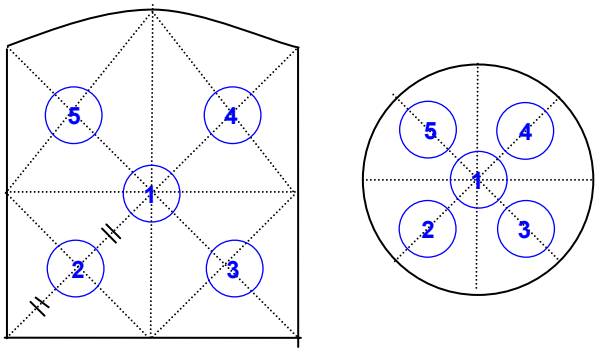


Fig. 41

4.2. TXB Series

When replacing the following components, balance performance may be altered. After replacement, check the performance and make adjustments if necessary.

Adjustments required \ Service		Reference	Main Board Assy(9) replacement	Analog Board Assy (10) replacement	Power Board Assy (11) replacement	ROM Version Up	Load Cell Assy (12) replacement	Tools required
			2.2.3.1	2.2.3.2	2.2.3.3	7.2	2.2.3.4	
1	**the Cornerload Error** adjustment	4.2.1					✓	
2	the four displacement stop screws for the load cell Assy Ad	2.2.3.4 8)					✓	
3	Coef. data Writing to EEPROM	6.2	✓ *1)				✓ *2)	
4	Linearity adjustment	5.5		✓			✓	Standard weight
5	Calibration (E-CAL)	5.6		✓			✓	Standard weight
6	Error log reset *3)	6.2	✓	✓	✓	✓	✓	
7	EEPROM Data Backup	6.3	✓	✓	✓	✓	✓	

*1) When the main board Assy (9) has been replaced, mount the EEPROM from the previous main board Assy(9).

*2) When the load cell Assy (1) has been replaced, input the attached EEPROM data.
Address No. 004 – 05A (Temperature coefficient data) **and 14A – 158**(Creep coefficient data. TXB only)

*3) All of the EEPROM data of **address No. 288 – 28D** are set to “0”(zero).

4.2.1. Adjusting ZERO balance of load cell

It can adjust zero balance of load cell by length of AD wire when too changing zero balance. It need digital multi-meter and AD wire for adjustment.

1) Check “WAD” of no loading(zero gram condition) and within from “60,000” to “80,000” counts.
2) Input WAD value to the EXCEL file(adjustment software).

Zero Adjustment Sheet for TXB Load cell

Adjustment ZERO Wad value

ZERO WAD is over target -> Insert the Advance wire to (A) ZERO WAD is under target -> Insert the Advance wire to (B)
0.3 Advance wire：10000count/1cm
Target value：60000 - 80000(set actual pan and pan supporter)

S/N	Zero AD value (befor adjustment)	Result	Length of AD wire		Zero AD value (after adjustment)	Judgement
D5XXXXXXXX	54500	--->	B	1.6cm	64200	OK
		-		-		-
		-	-	-		-
		-	-	-		-
		-	-	-		-
		-	-	-		-
		-	-	-		-
		-	-	-		-
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		-	-	-		-
		-	-	-		-
		-	-	-		-
		-	-	-		-

3) Confirm AD wire attaching condition, A position, B position or non.
4) Adjust AD wire length by referring below table.

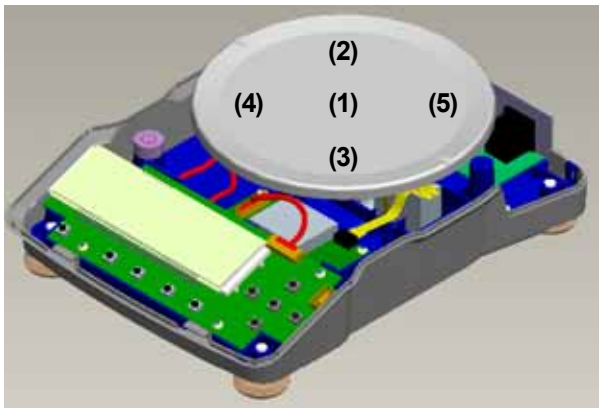
Attaching AD wire position	Result	
	A	B
Non	Attach	Attach
A	Add	Cut
B	Cut	Add

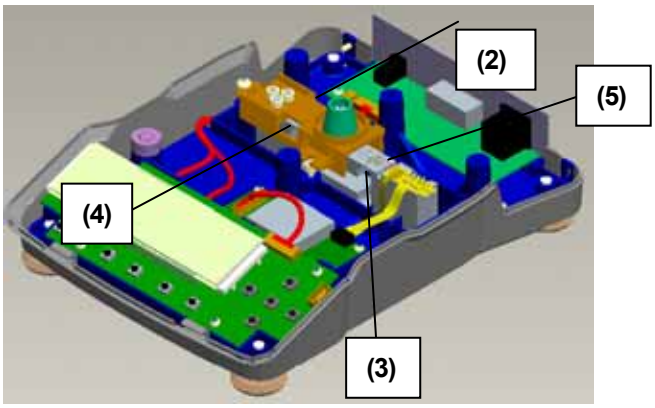
5) Set pan and pan supporter and check WAD value again.
6) Input WAD value “After adjustment” column. Appearing “NG” in the “Judgment” column, try AD wire length adjustment again.

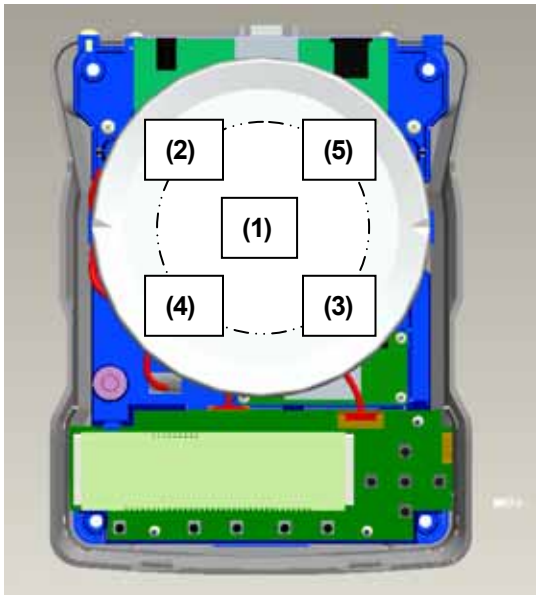
4.2.2. Adjusting the Corner load Error

*** This adjustment is only effective for minor errors (within ±30 counts).**
If the error is larger, replace the TXB unit Assy (1).

1) Use the procedure in "2.2.2 Inspecting the Balance Interior (Removing the Case and Pan Support)" to remove as far as the case Assy (3).
2) Use the two front level adjustment feet (8) to adjust the level of the balance so that the air bubbles in the level come to the center of the framed area.
3) [Large pan only] Lower the two rear level adjustment feet (8) until they contact the ground.
4) Mount the pan (1) and pan support (2), attach the AC adaptor, and turn on the power.
5) Press any key to change to the "g" display.
6) Place the approx half of capacity of weight on the pan (1), and press the [->0/T<-] key to change to the "0g" display.
7) First place the weight on the pan center (position (1) in Figure below).Then move the weight in the order of (2) → (3) → (4) → (5) → (1), while recording the display at each position.
8) Use the corner load adjustment tool (34) to cut the strain generator corresponding to the position where a **negative(-) value** was displayed.
9) Repeat steps 7) and 8) until the corner load error becomes sufficiently small. Then place the weight in positions (2), (3), (4), and (5) in that order, while recording the display at each position. Repeat adjustments until the result falls within the criteria.







5. Software Adjustment

5.1. EEPROM Initialization

There are two methods for initializing the EEPROM, as shown below.

(1) Initializing EEPROM When Turning On the Power

1) TW/TX Series: Press down the [BREAK] and [PRINT] keys, and switch on the power.
   TXB Series: Press the [BREAK] key, switch on the power, then while "CHE 5" is displayed, press down the [BREAK] and [PRINT] keys at the same time.
2) "EE INIT" is displayed.
3) Press the [MENU/Enter] key to display "PART".
   Press either the [FUNC] or [UNIT] key to display "ALL".
4) - In the "**PART**" display, keep pressing the [MENU/Enter] key until changing to “CHE 3” display: Initializes part of EEPROM data.
   Write to EEPROM the temperature correction coefficient, linearity correction coefficient, and model setting information (weight capacity, minimum display) that is backed up on Flash memory.
   - In the "**ALL**" display, keep pressing the [MENU/Enter] key until changing to “CHE 3” display: Initializes all EEPROM data, and write to EEPROM.
5) After initialization, move to the service mode.

(2) Initializing EEPROM from Service Menu

1) In the service menu, select [NVRAM] -> [INIT (All Initialize)].
2) The execution confirmation display [OK?] appears.
3) Press the [MENU/Enter] key to execute.
4) The initializing display appears.

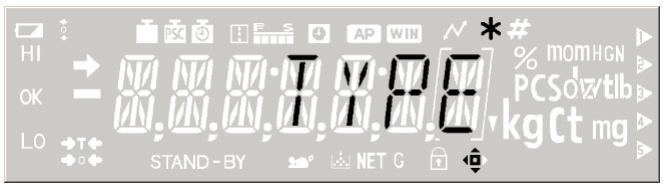
5) When initialization is completed, return to the service menu AD value display.

5.2. Model Selection

Select the Shimadzu standard model name. The operation procedure is as shown below.

1) In the service menu, press either the [FUNC] or [UNIT] key, and then select [Model Selection] (TYPE).
2) Press the [MENU/Enter] key.

[Menu display example for model selection]



[Caution]
If TYPE does not appear on the menu display, the setting information lock must be released.
*** See "5.3.1 Releasing the Setting Information Lock."**

(4) Press either the [FUNC] or [UNIT] key to read out the model name stored in EEPROM, and display it on the LCD.

[Display example for model name TX323L]

(5) Press the [MENU/Enter] key to determine the model.

- Model name display is a maximum of seven characters. (Due to limitation to the panel display, numbers are displayed on the left and alphabetical characters on the right, separated by a "." dot.)
- If the OEM setting is set to ON, and the specified model name has not been input, a corresponding Shimadzu standard model name will be displayed.

[Model Settings]

For TX/TXC,TXB of Ver 1.00,XX,XX

Display	Model Name	Specifications (weight capacity, minimum display)
323.TXC	TXC323L	320 ct/0.001 ct (64 g/0.0002 g)
623.TXC	TXC623L	620 ct/0.001 ct (124g /0.0002 g)
223.TX	TX223L	220 g/0.001 g
323.TX	TX323L	320 g/0.001 g
2202.TX	TX2202L	2,200 g/0.01 g
3202.TX	TX3202L	3,200 g/0.01 g
222.TXB	TXB222L	220 g/0.01 g
422.TXB	TXB422L	420 g/0.01 g
622.TXB	TXB622L	620 g/0.01 g
621.TXB	TXB621L	620 g/0.1 g
2201.TXB	TXB2201L	2,200 g/0.1 g
4201.TXB	TXB4201L	4,200 g/0.1 g
6201.TXB	TXB6201L	6,200 g/0.1 g
6200.TXB	TXB6200L	6,200 g/1 g

For TW,TWC/TX,TXC (except for TXB) of Ver2.00,XX,XX and over

Display	Model Name	Specifications (weight capacity, minimum display)
323.TXC	TXC323L	320ct/0.001ct (64g/0.0002g)
623.TXC	TXC623L	620ct/0.001ct (124g/0.0002g)
223.TX	TX223L	220g/0.001g
323.TX	TX323L	320g/0.001g
423.TX	TX423L	420g/0.001g
2202.TX	TX2202L	2200g/0.01g
3202.TX	TX3202L	3200g/0.01g
4202.TX	TX4202L	4200g/0.01g
323.TWC	TWC323L	320ct/0.001ct (64g/0.0002g)
623.TWC	TWC623L	620ct/0.001ct (124g/0.0002g)
223.TW	TW223L	220g/0.001g
323.TW	TW323L	320g/0.001g
423.TW	TW423L	420g/0.001g
2202.TW	~~TW2202L~~	~~2200g/0.01g~~
3202.TW	~~TW3202L~~	~~3200g/0.01g~~
4202.TW	~~TW4202L~~	~~4200g/0.01g~~

5.3. Setting Information Lock

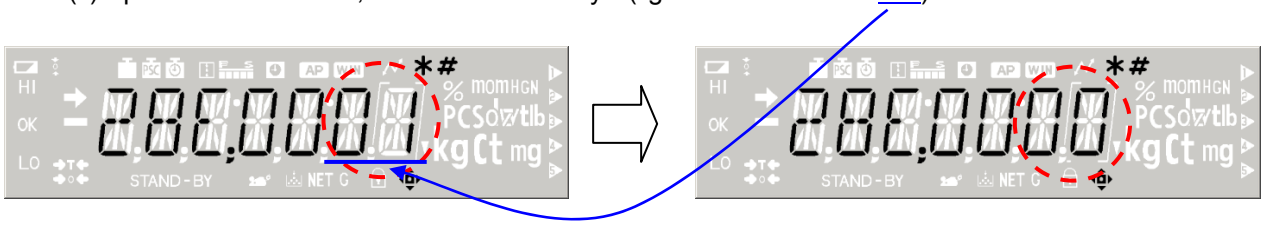
There will be cases where the setting information lock must be released due to calibration error, etc., to reselect the model and perform readjustment.

In such cases, follow the procedure below to release and set the setting information lock.

5.3.1. Releasing the Setting Information Lock

(1) In the service menu, select “NVRAM” -> “EDIT” (Data edit). * See "6.2 Data Edit (EDIT) Operations."

(2) Input the address "28E", and edit the lowest byte (right side: Address No.28F) from "01" to "00".



(3) In the service menu, check that “TYPE” is displayed next to “LINEAR”.

5.3.2. Setting the Setting Information Lock

(1) In the service menu, select [LOCK].

(2) The “OK?” confirmation is displayed. Press the [MENU/Enter] key to lock the setting information.

[Caution] If the setting information is not locked, the calibration error check will not occur. Therefore, even if an unsuitable weight is used during calibration, or if an unsuitable calibration operation is performed, the sensitivity calibration coefficient is calculated without any conditions, resulting in problems in the measurement data display.

5.4. Inputting Reference Weight Values for Linearity Adjustment

Before executing linearity adjustment, input the reference weight values to be used.

(1) Enter service mode and select [LINEAR] -> [L.W.SET].

(2) Determine the reference weight required for linearity adjustment, depending on the model setting.
(The mass of the weight and the number of measurements required)

(3) The reference weights required are displayed.

(4) Input the reference weight mass (including the certified value). See the table below, "Linearity Adjustment Reference Weights."

(5) Confirm the reference weight value input. (5 points, excluding 0)

(6) Repeat steps (4) and (5) up to the number of reference weights required.

(7) When input for all weights is completed, return to the menu item display for linearity adjustment weight value input.

[Linearity Adjustment Reference Weights]

It may different Weight value after EEPROM initializing or model setting.

Model name	Number of Measurements	Reference Weight Value						CAL Value
TXC323L TWC323L	6	**0**	**15**	**30**	**45**	**60**	**65**	**50**
TXC623L TWC623L	6	**0**	**30**	**60**	**90**	**120**	**130**	**100**
TX223L TW223L	6	**0**	**50**	**100**	**150**	**200**	**250**	**200**
TX323L TW323L	6	**0**	**100**	**150**	**200**	**300**	**350**	**200**
TX423L TW423L	6	**0**	**100**	**200**	**300**	**400**	**450**	**400**
TX2202L ~~TW2202L~~	6	**0**	**500**	**1000**	**1500**	**2000**	**2500**	**2000**
TX3202L ~~TW3202L~~	6	**0**	**1000**	**1500**	**2000**	**3000**	**3500**	**2000**
TX4202L ~~TW4202L~~	6	**0**	**1000**	**2000**	**3000**	**4000**	**4500**	**4000**
TXB222L	6	**0**	**50**	**100**	**150**	**200**	**250**	**200**
TXB422L	6	**0**	**100**	**200**	**300**	**400**	**450**	**400**
TXB622L	6	**0**	**150**	**300**	**450**	**600**	**650**	**500**
TXB621L	6	**0**	**150**	**300**	**450**	**600**	**650**	**500**
TXB2201L	6	**0**	**500**	**1000**	**1500**	**2000**	**2500**	**2000**
TXB4201L	6	**0**	**1000**	**2000**	**3000**	**4000**	**4500**	**4000**
TXB6201L	6	**0**	**1500**	**3000**	**4500**	**6000**	**6500**	**5000**
TXB6200L	6	**0**	**1500**	**3000**	**4500**	**6000**	**6500**	**5000**

5.5. Linearity Adjustment

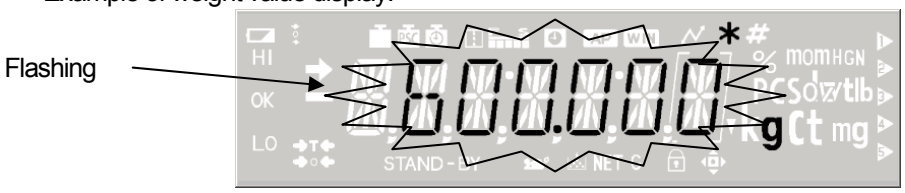
To satisfy linearity specifications, calculate the coefficient for correcting hardware linearity errors.
The operation procedure is as shown below.

(1) Press the [MENU/Enter] key, and select "LINEAR" -> "L.ADJUST".

(2) "START" displaying and press the [MENU/Enter] key.

(3) Following the display for the previously input linearity adjustment weight value, place a weight on the pan, and **after the stability mark appeared**, press the [MENU/Enter] key to confirm the measurement, then proceed to the next measurement.

Example of weight value display:



(4) When all adjustment data measurement is completed, the correction coefficient is calculated and saved in EEPROM automatically.

5.6. Calibration of internal weight (PCAL) (Only TW series)

Execute internal weight calibration in the same way as user mode.
Reference weight for PCAL is shown in the bellow table.
Confirm nothing on the pan before executing PCAL.

[Reference weight]

Model name	CAL Value
TWC323L	**50g**
TWC623L	**100g**
TW223L	**200g**
TW323L	**300g**
TW423L	**400g**
~~TW2202L~~	~~2000g~~
~~TW3202L~~	~~3000g~~
~~TW4202L~~	~~4000g~~

1) Keep pushing [CAL] key until display changes.
2) "P.CAL" is displayed pushing [UNIT] key or [FUNC] key.
   Then [MENU/ENTER] key is pushed.
3) If an error occurs, display the error code.
   For error content, see section 6.6.2.
4) If no occurs, update the sensitivity correction coefficient and save to EEPROM.
   In addition, back up the sensitivity correction coefficient to Flash memory.
5) After completion, return to the AD value display.

5.7. Sensitivity Calibration by External weight

Execute sensitivity calibration in the same way as user mode.

If sensitivity calibration is executed in service mode while setting information is locked, any errors that occur result in display of detailed error codes.

Execute sensitivity calibration using the same operation as user mode.

Procedures

(1) Press the [CAL] key.
(2) Execute sensitivity calibration.
(3) If an error occurs, display the error code.
For error content, see section 6.6.2.
(4) If no occurs, update the sensitivity correction coefficient and save to EEPROM.
In addition, back up the sensitivity correction coefficient to Flash memory.
(5) After completion, return to the AD value display.

While detailed error codes are not displayed in user mode, they are displayed in service mode, as shown in the table below. To return from the error display, press the [Break] key.

Code	Error Name	Description
C-ERR1	Instability error	Measurement value at zero point or weight measurement is unstable. Stabilization mark failed to light up even after 15 seconds had elapsed since weight was placed or removed.
C-ERR2	Zero point error	Drift from zero point since last sensitivity calibration is large. Object exceeding 20% of weight capacity is placed on the pan, or a change in the zero point equivalent to excess of 20% of weight capacity occurred.
C-ERR4	Span error	Difference between the set reference weight value and measured weight span value exceeds 2% of the weight mass.

i. Operation and execution of sensitivity calibration, and the operating procedure for the sensitivity calibration menu is the same as in the user mode, and does not appear as a service mode menu item.
ii. Prepare the reference weights listed in the table below for CAL values.

[Reference Weight Values]

Model Name	CAL Value
TXC323L TWC323L	**50**
TXC623L TWC623L	**100**
TX223L TW223L	**200**
TX323L TW323L	**200**
TX423L TW423L	**400**
TX2202L ~~TW2202L~~	**2000**
TX3202L ~~TW3202L~~	**2000**
TX4202L ~~TW4202L~~	**4000**

[Reference Weight Values]

Model Name	CAL Value
TXB222L	**200**
TXB422L	**400**
TXB622L	**500**
TXB621L	**500**
TXB2201L	**2000**
TXB4201L	**4000**
TXB6201L	**5000**
TXB6200L	**5000**

5.8. Sensitivity Calibration by internal weight (Only TW series)

Execute sensitivity calibration in the same way as user mode.

If sensitivity calibration is executed in service mode while setting information is locked, any errors that occur result in display of detailed error codes.

Execute sensitivity calibration using the same operation as user mode.

Procedures

(1) Press the [CAL] key.
(2) Execute sensitivity calibration.
(3) If an error occurs, display the error code.
For error content, see section 6.6.2.
(4) If no occurs, update the sensitivity correction coefficient and save to EEPROM.
In addition, back up the sensitivity correction coefficient to Flash memory.
(5) After completion, return to the AD value display.

While detailed error codes are not displayed in user mode, they are displayed in service mode, as shown in the table below. To return from the error display, press the [Break] key.

Code	Error Name	Description
C-ERR1	Instability error	Measurement value at zero point or weight measurement is unstable. Stabilization mark failed to light up even after 15 seconds had elapsed since weight was placed or removed.
C-ERR2	Zero point error	Drift from zero point since last sensitivity calibration is large. Object exceeding 20% of weight capacity is placed on the pan, or a change in the zero point equivalent to excess of 20% of weight capacity occurred.
C-ERR4	Span error	Difference between the set reference weight value and measured weight span value exceeds 2% of the weight mass.

i. Operation and execution of sensitivity calibration, and the operating procedure for the sensitivity calibration menu is the same as in the user mode, and does not appear as a service mode menu item.
ii. Prepare the reference weights listed in the table below for CAL values.

5.9. Weight loader check (Only TW series)

Execute confirmation of weight loader function.

Procedure

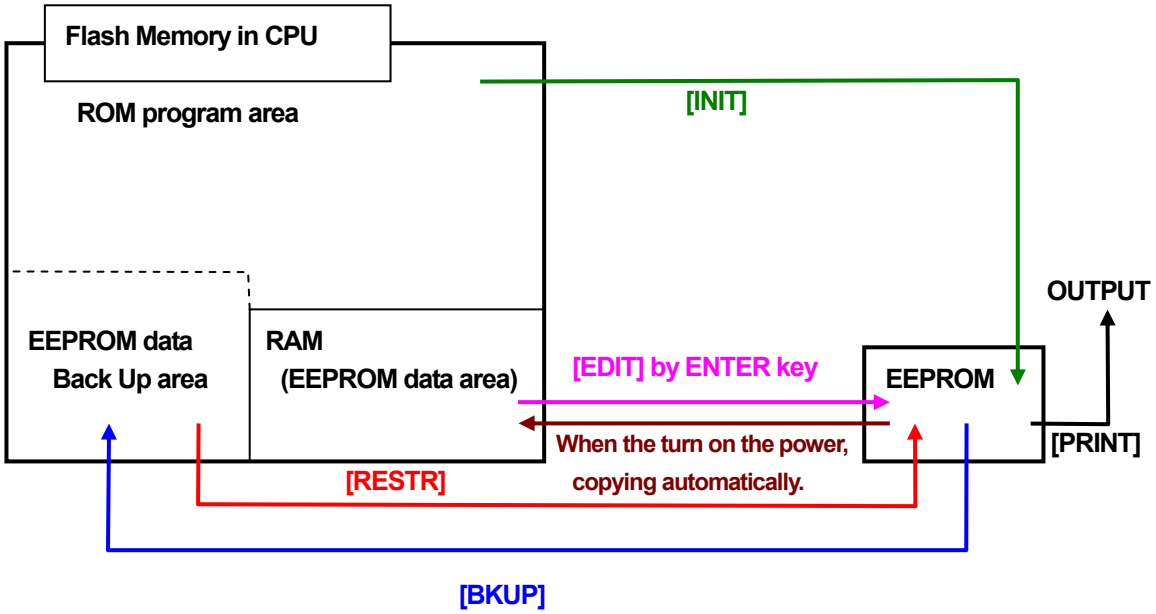
1) Push the [MENU] key and select ”LD.W” .

2) Select ”HOME” or ”LD.UNLD”.

“HOME” = Return to initial position

“LD.ULD” = Internal weight is loaded or unloaded to UNIT ASSY.

6. EEPROM



	Address No.	Ref.
Temperature coefficient data	004～05A	
Creep coefficient data	14A～158	TXB only
Error check	28F	ON：01　OFF:00
Error log	288～28D	For 5 logs
Password of user mode	3BE～3BF	9999:"3BE.0F27"

6.1. PRINT Operations

(1) In the service menu, select "NVRAM" -> "PRINT"(Print).

(2) The model name, S/N, software version No., and the address inside EEPROM are displayed as the header, and then data is printed.

[Print example]

TYPE : TX223L
S/N : 0000000000
V NO : 1.00,00,15
0000 : 07AB
0002 : ACAB
0004 : 0041
0006 : 0E47
·
·

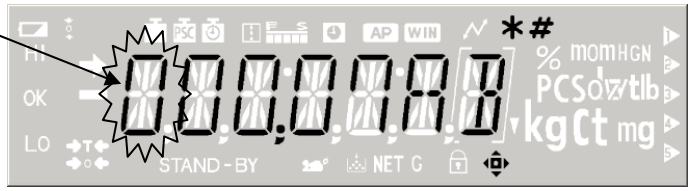
(3) When printing of all data is completed, return to the service menu AD value display.

6.2. Data Edit (EDIT) Operations

(1) In the service menu, select “NVRAM” -> “EDIT”(Data edit).

(2) Data with address in EEPROM are displayed as shown below.
The flashing value can be changed.

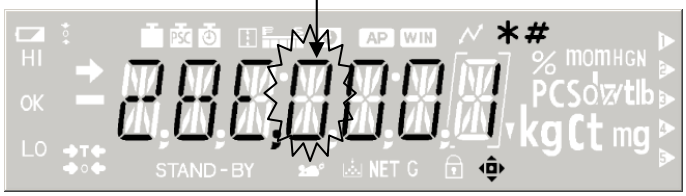
Flashing



(3) Input the address of the data to be edited. The address data is displayed (in the right four digits).

(4) Press the [MENU/Enter] key to confirm the address, and editing of that address data is enabled.

Flashing



(5) Edit the data.

(6) Press the [MENU/Enter] key to confirm the data, and the changed address data is saved.

(7) To continue editing, repeat the procedure from step (1).
When completed, press the [BREAK] key. Return to the service menu AD value display.

6.3. Backup (BKUP) Operations

(1) In the service menu, select “NVRAM” -> “BKUP (Backup)”.

(2) The execution confirmation display “OK?” appears.

(3) Press the [MENU/Enter] key. Data in EEPROM is backed up and saved to the microcomputer Flash memory.

(4) The backup progress indicator appears.

(5) When backup is completed, return to the service menu AD value display.

6.4. Download (RESTR) Operations

(1) In the service menu, select “NVRAM” -> “RESTR”(Download).

(2) The execution confirmation display “OK?” appears.

(3) Press the [MENU/Enter] key. Data backed up in the microcomputer FLASH memory is transferred to EEPROM.

(4) The download progress indicator appears.

(5) When download is completed, return to the service menu AD value display.

6.5. All Initialization (INIT) Operations

(1) In the service menu, select “NVRAM” -> “INIT”(All Initialize).

(2) The execution confirmation display “OK?” appears.

(3) Press the [MENU/Enter] key to execute.

(4) The initialization progress indicator appears.

(5) When initialization is completed, return to the service menu AD value display.

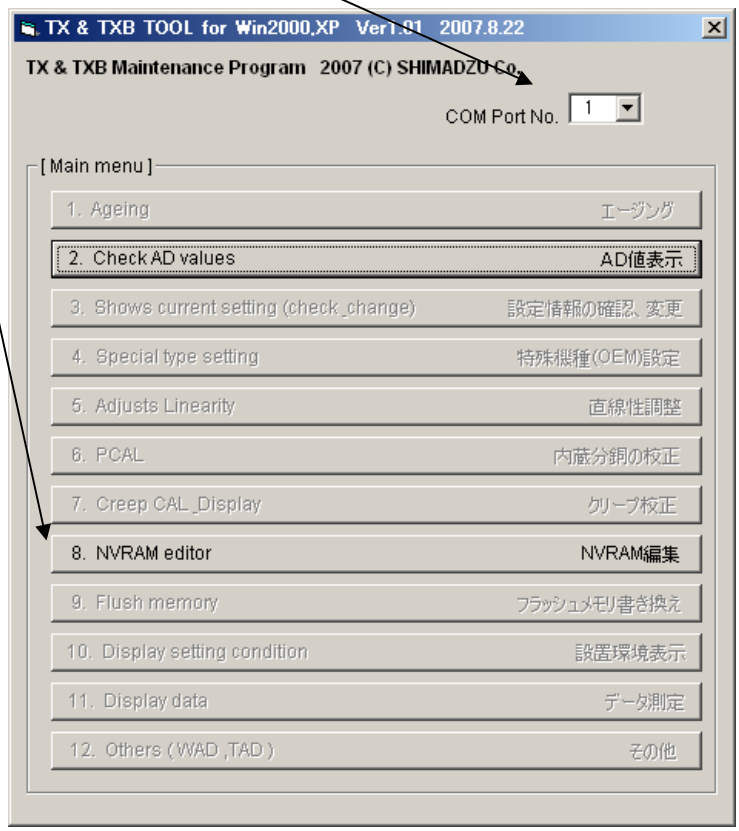
6.6. EEPROM data editing software

Confirm communication settings of the balance. (Especially, Handshaking)

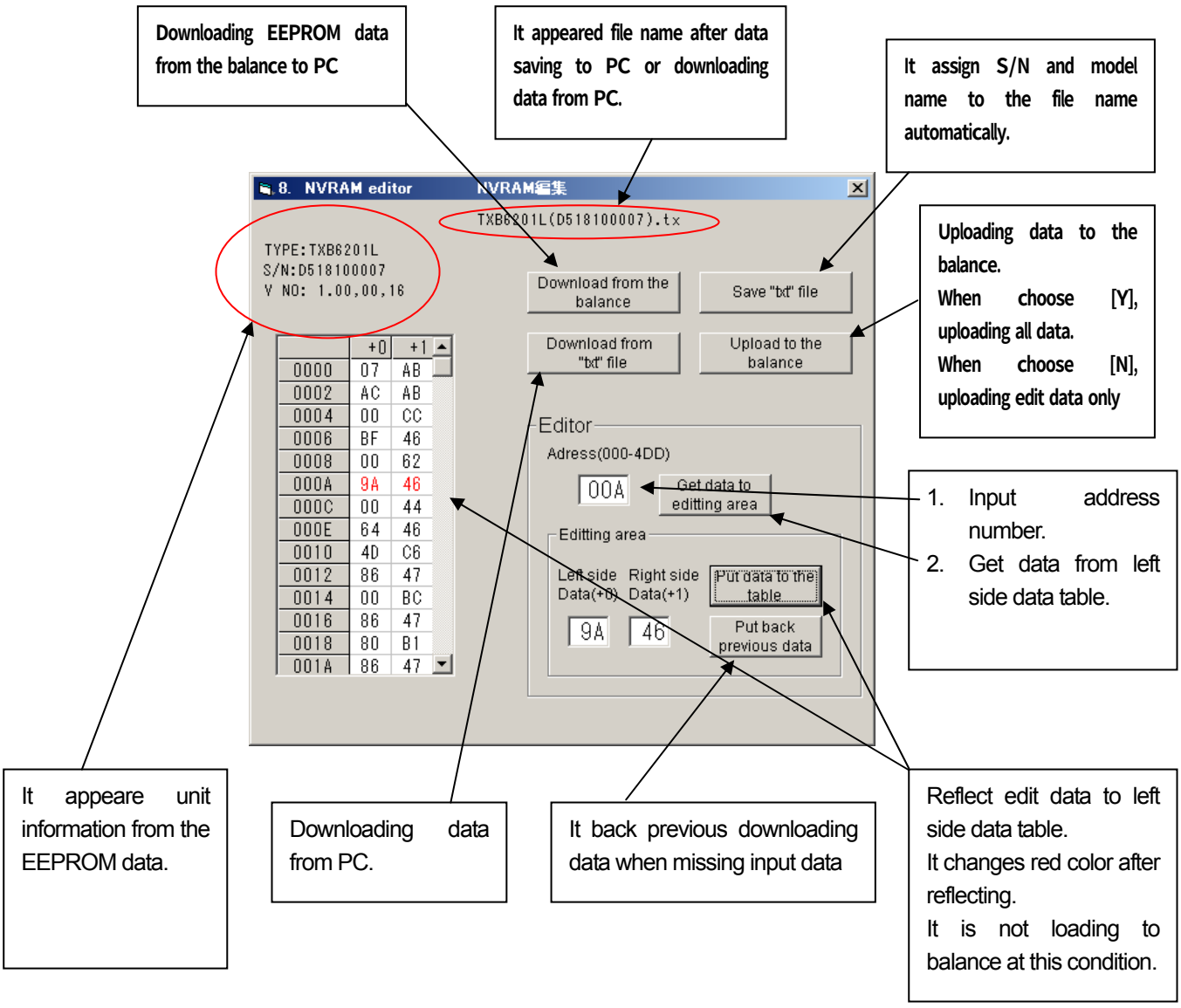
1) Run “T-tool” software.

2) Choose com port number.

3) Choose “8. NVRAM editor”


TX & TXB TOOL for Win2000,XP Ver1.01 2007.8.22
TX & TXB Maintenance Program 2007 (C) SHIMADZU Co.
COM Port No. 1
[Main menu]
1. Ageing エージング
2. Check AD values AD値表示
3. Shows current setting (check_change) 設定情報の確認、変更
4. Special type setting 特殊機種(OEM)設定
5. Adjusts Linearity 直線性調整
6. PCAL 内蔵分銅の校正
7. Creep CAL_Display クリープ校正
8. NVRAM editor NVRAM編集
9. Flush memory フラッシュメモリ書き換え
10. Display setting condition 設置環境表示
11. Display data データ測定
12. Others (WAD ,TAD) その他

4) Editing NVRAM menu


Downloading EEPROM data from the balance to PC
It appeared file name after data saving to PC or downloading data from PC.
It assign S/N and model name to the file name automatically.
8. NVRAM editor
NVRAM編集
TXB6201L(D518100007).tx
TYPE:TXB6201L
S/N:D518100007
V NO: 1.00,00,16
Download from the balance
Save "txt" file
Download from "txt" file
Upload to the balance
Uploading data to the balance.
When choose [Y], uploading all data.
When choose [N], uploading edit data only
Editor
Adress(000-4DD)
00A
Get data to editting area
Editting area
Left side Data(+0)
Right side Data(+1)
Put data to the table
9A
46
Put back previous data
1. Input address number.
2. Get data from left side data table.
It appeare unit information from the EEPROM data.
Downloading data from PC.
It back previous downloading data when missing input data
Reflect edit data to left side data table.
It changes red color after reflecting.
It is not loading to balance at this condition.

	+0	+1
0000	07	AB
0002	AC	AB
0004	00	CC
0006	BF	46
0008	00	62
000A	9A	46
000C	00	44
000E	64	46
0010	4D	C6
0012	86	47
0014	00	BC
0016	86	47
0018	80	B1
001A	86	47

5) Back-up EEPROM data by “BKUP” in the service menu.

7. Updating the Program

The TW/TX/TXB Series has a Flash memory microcomputer. You can use a special tool to easily update the program at customer site.

7.1. Programming Tools

Programming is performed using the following tools.

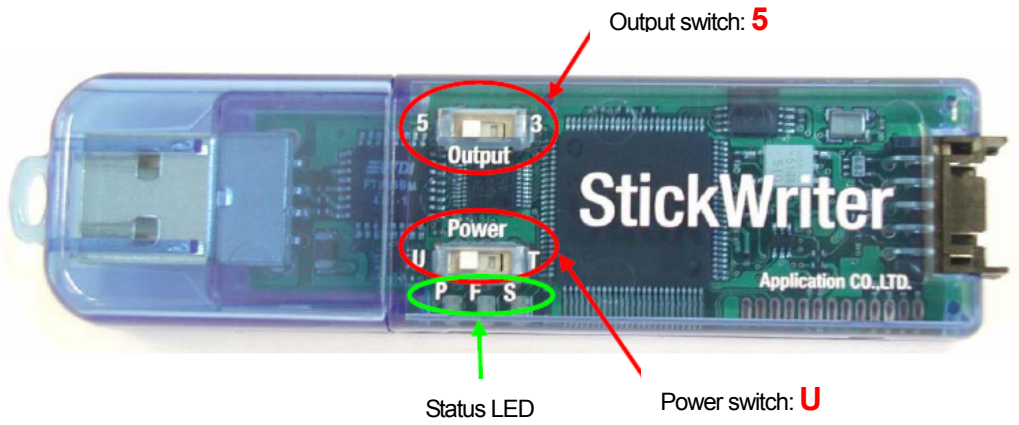
P/N	Name
774-49154	Flash Programmer SW-K0LX2
774-41751	Cable, Program Writer

7.2. Programming

7.2.1. Downloading the Program to the Tool

Procedure

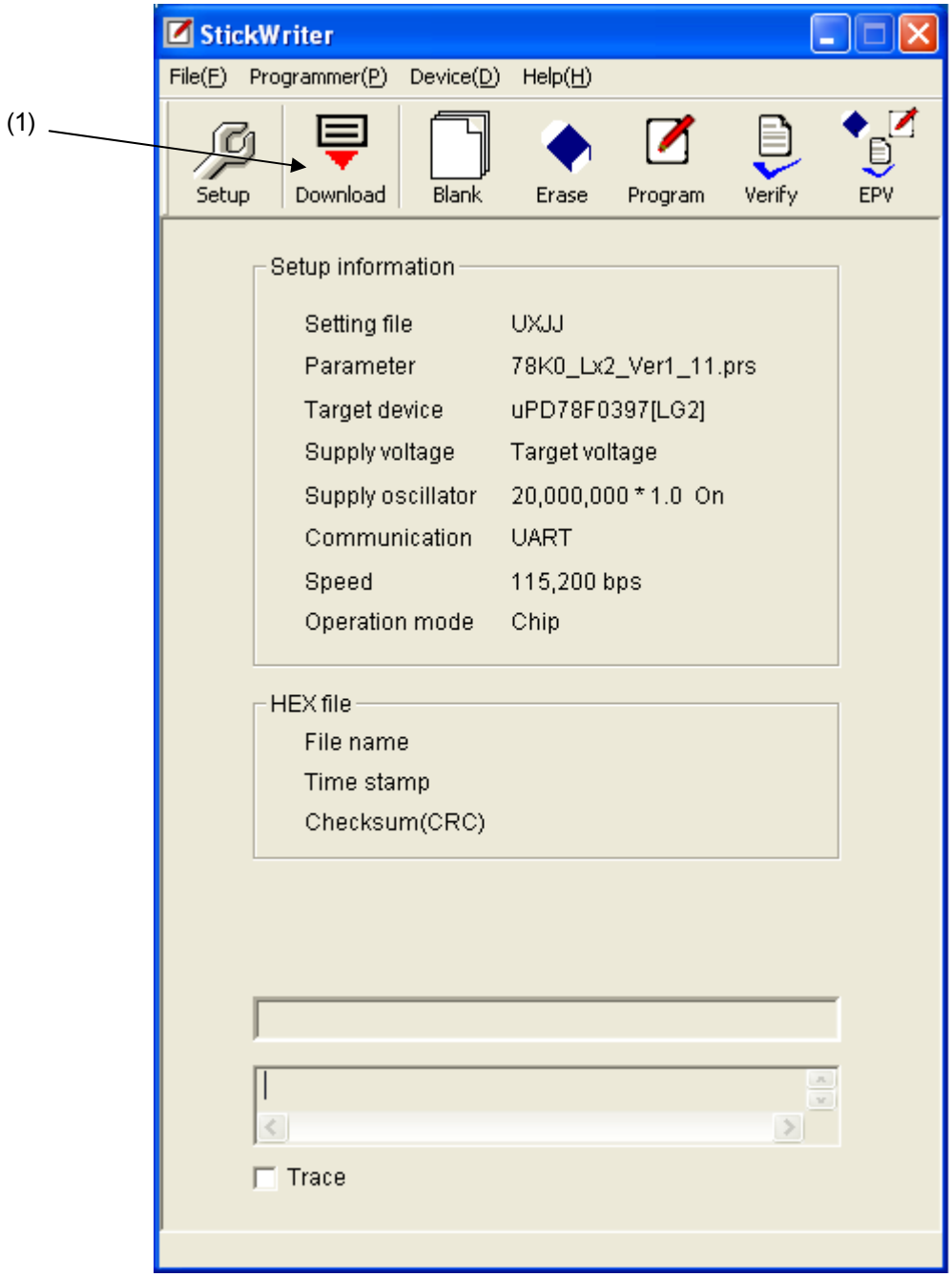
1) Set the Flash programmer SW-K0LX2 power switch to [U].



2) Remove the USB connector cap from the Flash programmer SW-K0LX2, and connect the Flash programmer SW-K0LX2 to a USB connector on the PC.

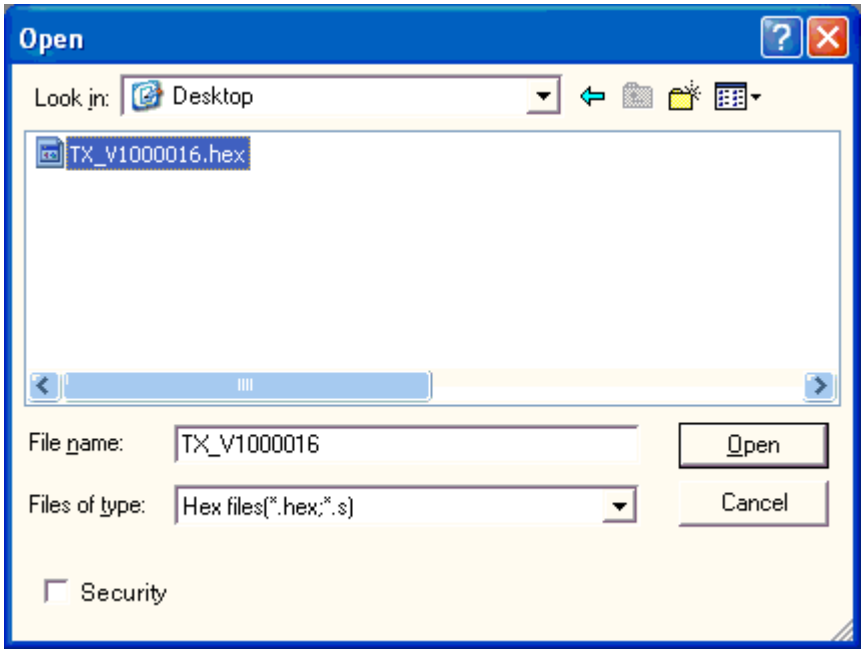
3) In the Windows Start menu, select [StickWriter] -> [StickWriter] and start up the application.

4) The window shown below is displayed.



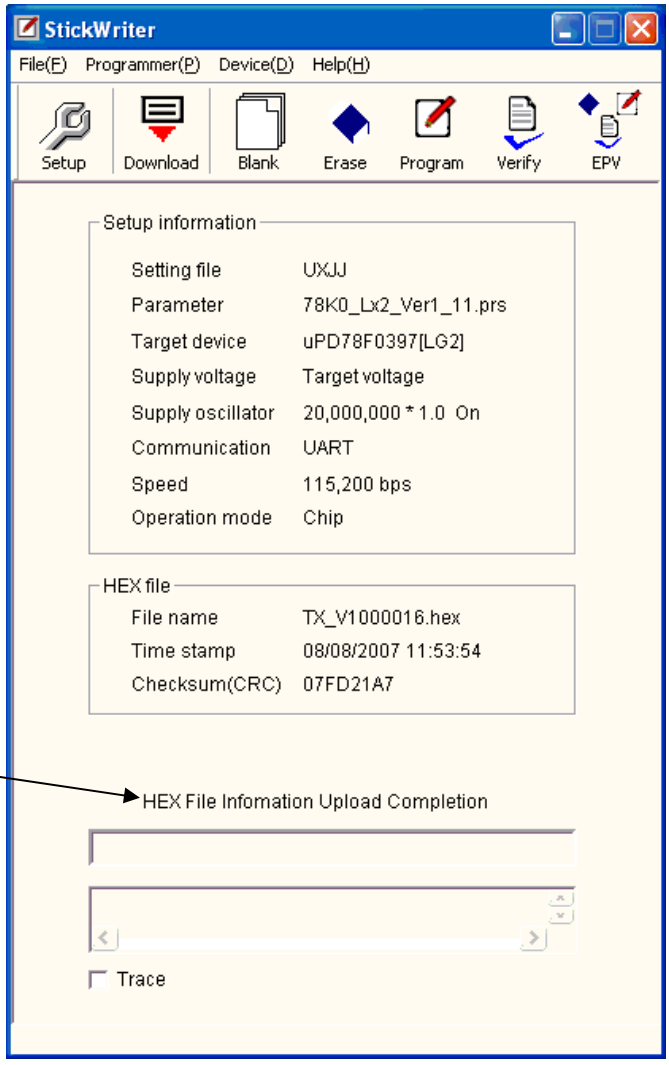
5) Click the [Download] button (1).

6) The window below is displayed. Select the program file (*.HEX) to download.
Selecting the folder containing the program file displays that program file (*.HEX).

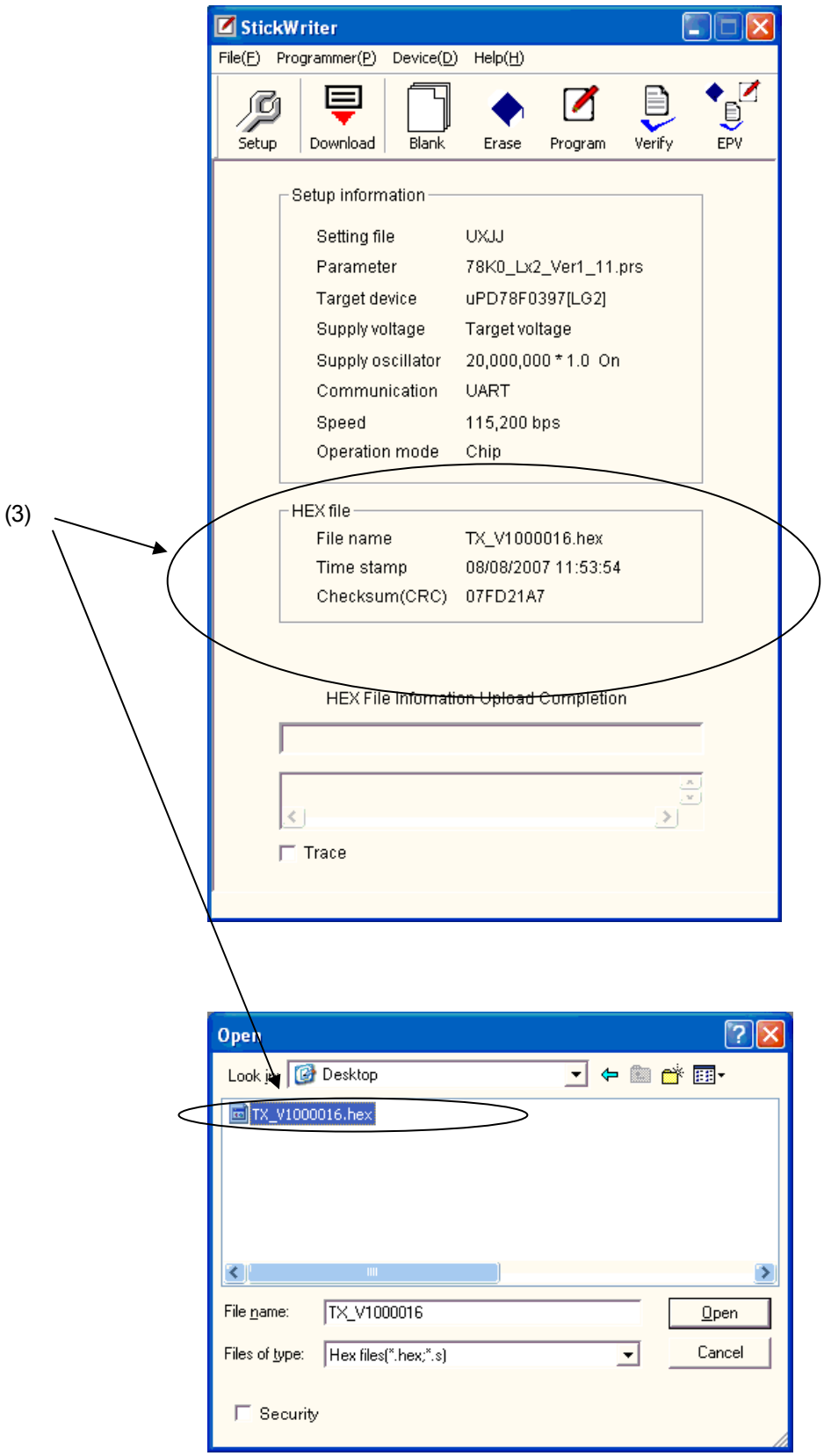


Click the file name, and click [Open] to start downloading the program file to Flash programmer SW-K0LX2.

7) When the download is completed, "HEX File Information Upload Completion" is displayed in the status display area (2).



8) The downloaded program file information is displayed in the "HEX File" area (3). Check the file name and file time stamp.



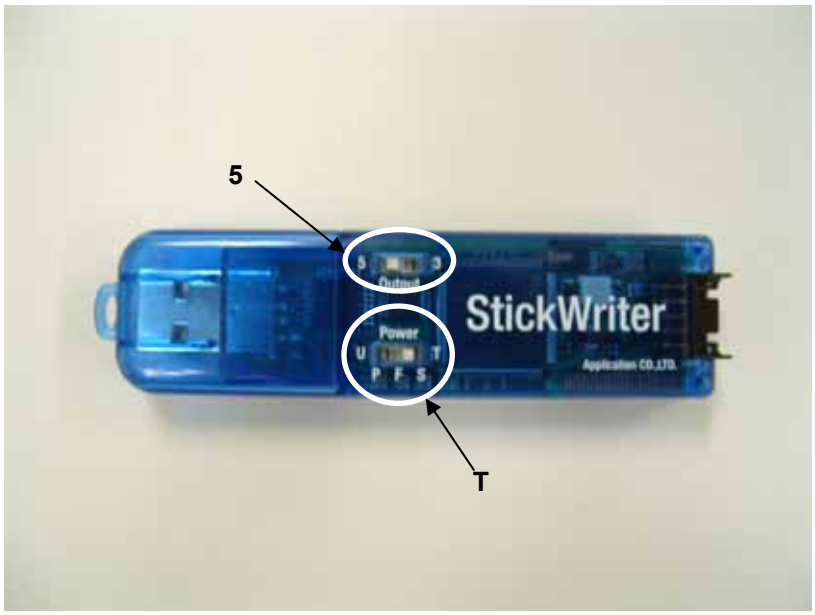
9) Close the application.

10) Remove Flash programmer SW-K0LX2 from the PC.

7.2.2. Preparing the Tool

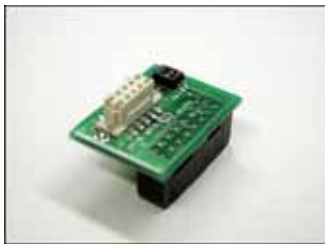
Procedure

1) Check that the Flash programmer SW-K0LX2 (774-49154) switches are set as shown in the figure below.
   (1) Output: **5**
   (2) Power: **T**



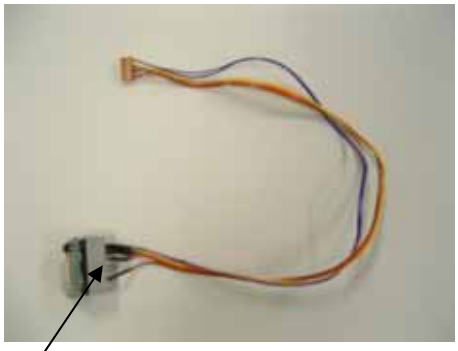
2) Connect the program writer cable (774-41751) to the accessory FP4 adaptor for the Flash programmer SW-K0LX2 (774-49154).

FP4 adaptor →



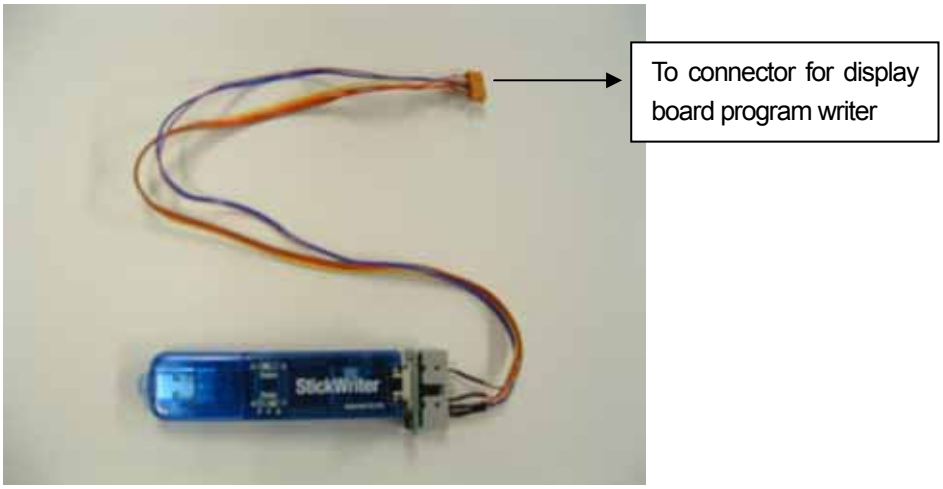
Check!
SW-1 1:ON
2:ON

Connect the FP4 adaptor and program writer cable (774-41751).



- Be careful not to injure your fingers or hands with the unconnected pins.
- Since a wiring disconnection will prevent programming from being completed, be careful when handling.

3) Connect the Flash programmer SW-K0LX2 (774-49154) to the cable prepared in step 1).



7.2.3. Programming

Procedure

1) Check that the TW/TX/TXB power is switched off.
2) Insert the 6-prong connector of the tool prepared in section 7.2.2 into the connector for the display board program writer.
   Program writer connector: TW/TX: J1 connector
   TXB: J3 connector

3) Switch on the power to TW/TX/TXB.
TW/TX: Attach the AC adaptor to the power jack.
TXB: Attach the AC adaptor to the power jack, and **keep pressing the [BREAK] key**.

4) Programming starts and the Status LED [P] flashes. Blue LED flashing during uploading.(one LED only)

Note: Shutting off the power while the Status LED [P] is flashing could cause programs in display board CPU and programs in the Flash programmer SW-K0LX2 to disappear. Be particularly careful with TXB.

5) Programming is completed in about **30 - 40 seconds**, and the Status LED [P] changes from flashing to lighted. At the same time, Status LED [S] lights. (Two LED lighting after up-load completing.)
6) Switch off the power to TX/TXB.
7) Disconnect the tool.
8) Switch on power to the balance, and check that the Version number and balance operates.
9) Back-up EEPROM data to the flash memory.(Choose "BKUP" of the service menu)

Special Note: If programming fails, Status LED [F] lights up in red color.
In this case,
- **Shut off power to the TX/TXB, disconnect the connection to the tool and the display board connector, and restart programming from step 1).**
- **If programming fails even after repeating the above steps, there may be a break in the program writer cable (774-41751). Replace the cable.**
When replacing the program writer cable (774-41751), follow steps 1) to 3) in section 10.2.2 in reverse order to remove the cable.

Don't forget EEPROM data back up [BKUP] after reloading ROM program (ROM version up).

8. Performance Inspection

Before starting the performance inspection, turn on the power and leave the balance in the mass display state (backlight turned on) for at least an hour.

Also be sure that the location is not subject to wind, vibrations, or sudden temperature changes.

8.1. Reproducibility

1) Place the weight specified in Table 1 on the center of the pan, and then remove it. Repeat this five times to find the amount of variation at the zero point and the weighing capacity, Rx and Ry.

$$R_x = X_{\max} - X_{\min} \qquad : X_1, X_2 \quad \cdots X_5$$

$$R_y = Y_{\max} - Y_{\min} \qquad : Y_1, Y_2 \quad \cdots Y_5$$

("max" shows the maximum value, and "min" shows the minimum value.)

8.2. Cornerload Error

1) Prepare the weight specified in Table 1.
2) First place the weight on the pan center (see Fig. 24 in 4.1.3 Adjusting the Cornerload Error). Then move the weight in the order of $2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 1$, while recording the display at each position.
3) If the differences (cornerload error) between the display values at the positions 2, 3, 4, and 5, and the display value at the center position (1) are all within the criteria, conditions are normal.
   Example: (Error at position 3) = (Display value at position 3) - (Average of two display values at position 1)
4) If the errors are minor, follow "4.1.3 Adjusting the Cornerload Error".

   *** This adjustment is only effective for minor errors (within ±30 counts).**
   If the error is larger, replace the unit Assy (1).

8.3. Linearity

1) Use a weight to execute "E CAL" once.
2) Place weights in the order shown in Table 1, and record the display value when it stabilizes.
3) Calculate the error at each load.
   (Error) = (Display value at each load) - (Average of zero point display values) - (Weight certified value)
4) If the errors are minor, follow "5.5 Linearity Adjustment".

   *** This adjustment is only effective for minor errors (within ±10 counts).**
   If the error is larger, replace the unit Assy (1).

8.4. Tilt Error

10) Press the "->0/T<-" key to change to the "0g" display. (A)
11) Insert a plate with thickness of 1 mm under the two right level adjustment feet and, when the display is stable, record the display value. (B)
    (Error) = (B) - (A)
12) If the error is large, follow "4.1.2 Adjusting the Tilt Error".

Table 1 TW/TX Series Inspection Criteria

Model		TWC323L TXC323L	TWC623L TXC623L	TW223L TX223L	TW323L TX323L	TW423L TX423L	TW2202L TX2202L	TW3202L TX3202L	TW4202L TX4202L
Weighing Capacity		320ct	620ct	220g	320g	420g	2,200g	3,200g	4,200g
Minimum Display		0.001ct	0.001ct	0.001g	0.001g	0.001g	0.01g	0.01g	0.01g
Reproducibility (Rx, Ry)		0.006ct	0.006ct	0.006g	0.006g	0.006g	0.06g	0.06g	0.06g
	Weight	300ct (60g)	500ct (100g)	200g	300g	400g	2,000g	3,000g	4,000g
Cornerload Error		±0.002ct	±0.002ct	±0.002g	±0.002g	±0.004g	±0.02g	±0.02g	±0.04g
	Weight	150ct (30g)	250ct (50g)	100g	150g	200g	1,000g	1,500g	2,000g
Linearity		±0.004ct	±0.004ct	±0.004g	±0.004g	±0.004g	±0.04g	±0.04g	±0.04g
Tilt Error		±0.05ct	±0.05ct	±0.03g	±0.03g	±0.03g	±0.3g	±0.3g	±0.3g

Table 2 TXB Series Inspection Criteria

Model		TXB222L	TXB422L	TXB622L	TXB621L
Weighing Capacity		220 g	420 g	620 g	620 g
Minimum Display		0.01 g	0.01 g	0.01 g	0.1 g
Reproducibility (Rx, Ry)		0.06 g	0.06 g	0.06 g	0.6 g
	Weight	200 g	400 g	600 g	600 g
Cornerload Error		±0.02 g	±0.02 g	±0.02 g	±0.2 g
	Weight	100 g	200 g	300 g	300 g
Linearity		±0.04 g	±0.04 g	±0.04 g	±0.4 g
Tilt Error		±0.3 g	±0.3 g	±0.3 g	±3 g

Model		TXB2201L	TXB4201L	TXB6201L	TXB6200L
Weighing Capacity		2,200 g	4,200 g	6,200 g	6,200 g
Minimum Display		0.1 g	0.1 g	0.1 g	1 g
Reproducibility (Rx, Ry)		0.6 g	0.6 g	0.6 g	6 g
	Weight	2,000 g	4,000 g	6,000 g	6,000 g
Cornerload Error		±0.2 g	±0.2 g	±0.2 g	±2 g
	Weight	1,000 g	2,000 g	3,000 g	3,000 g
Linearity		±0.4 g	±0.4 g	±0.4 g	±4 g
Tilt Error		±3 g	±3 g	±3 g	±30 g

9. Problems and Solutions

9.1. General Problem Solutions

Problem	Cause	Solution	TW/TX	TXB
Nothing appears on the display	1) Power voltage not compatible.	Check the power supply, and connect correctly.	✓	
	2) Problem with supply voltage or AC adaptor	Replace the AC adaptor.	✓	✓
	3) Power board Assy (B4) fault	Replace the power board Assy (B4).	✓	✓
	4) Main board Assy (B2) fault	Replace the main board Assy (B2).	✓	✓
Numerals or symbols not displayed properly	1) Main board Assy (B2) fault	Replace the main board Assy (B2).	✓	✓
Key operation does not work	1) Main board Assy (B2) fault	Replace the main board Assy (B2).	✓	✓
	2) Fixing fault in case Assy (3)	Refix the case Assy (3) in place.	✓	✓
"0L" or "-0L" is displayed	1) Contact with stopper plate (U14) and stabilizer pin	Realign the stopper plate (U14).	✓	✓
	2) Pt-Ni band (U17) fault	Check the Pt-Ni band (U17), and connect correctly.	✓	
	3) Contact with force coil Assy (L1) and magnet Assy (U9)	Reset or replace the force coil Assy (L1).	✓	
	4) Force coil Assy (L1) fault	Replace the force coil Assy (L1).	✓	
	5) Damage to OPF (U1)	Replace the unit Assy (1).	✓	
	6) Detector Assy (U11) fault	Replace the detector Assy (U11).	✓	
	7) Analog board Assy (B3) fault	Replace the analog board Assy (B3).	✓	
Large zero or span drift	1) Not enough time allowed for warmup	Perform unit warmup.	✓	✓
	2) Unit under direct sunlight, or subject to breeze from air conditioner	Change the balance installation site.	✓	✓
Span is incorrect	1) Not horizontally adjusted	Use the level adjustment feet (B6) to adjust the level.	✓	✓
	2) Balance has been relocated	Calibrate the span (sensitivity) at the current installation site.		✓
	3) Damage to OPF (U1)	Replace the unit Assy (1).	✓	
Large cornerload error (30 d or larger)	1) Damage to OPF (U1)	Replace the unit Assy (1), and readjust.	✓	
	2) Load cell breakdown	Replace the load cell Assy, and readjust.		✓
Poor measurement reproducibility Large fluctuation in display values Difficulty in getting stability mark to light up	1) Affected by breezes or vibration	Relocate the balance. Change to high-stability settings.	✓	✓
	2) Cable between detector Assy (U11) and analog board Assy (B3) contacts the base	Rearrange the cable.	✓	✓
	3) Contact with stopper plate (U14) and stabilizer pin	Realign the stopper plate (U14).	✓	✓
	4) Contact with force coil Assy (L1) and magnet Assy (U9)	Reset or replace the force coil Assy (L1).	✓	
	5) Dust adheres to inside of force coil Assy (L1) or magnet Assy (U9)	Remove dust.	✓	
	6) Temperature sensor fault	Re-solder the temperature sensor to the detector Assy (U11).	✓	
	7) Damage to OPF (U1)	Replace the unit Assy (1).	✓	
	8) Analog board Assy (B3) fault	Replace the analog board Assy (B3).	✓	
	9) Detector Assy (U11) fault	Replace the detector Assy (U11).	✓	✓
Unstable display	1)Touching bottom of Pan supporter and Notch of Pan ring	Four Notches of Pan Ring are inserted in exactly. (Refer to "Installation" in the instruction manual.)		✓

Problem	Cause	Solution	TW/TX	TXB
Large linearity error	1) Linearity adjustment fault	Readjust linearity. If over 10 d, replace the unit.	✓	✓
	2) Damage to OPF (U1)	Replace the unit Assy (1).	✓	
	3) Load cell breakdown	Replace the load cell Assy.		✓
"ERR H" is displayed	- StickWriter used to write a program, resulting in data mismatch between microcomputer and EEPROM. (Restart the power, and if no error display appears, the situation is normal.)	Restart the power.	✓	✓
	- Breakdown of temperature sensor used to measure and correct UniBloc sensor temperature characteristics. .	Check the sensor solder. Check the TAD value.	✓	
	- Abnormal data for various correction coefficients for mass display, balance information, and menu setting conditions, etc.	Download the data again.	✓	✓
	- Weight loader Assy(27) fault (TW only) (snapping, sensor fault, short of motor coil)	Check connect and sordering of wires. Replace the weight loader Assy(27) Replace the main board Assy(B2(	✓	
With power switched on display stops at "CHE 0"	EEPROM not set correctly.	Reset the EEPROM.	✓	✓

9.2. Error Display

9.2.1. User Mode Errors

Display	Error Name	Description
ERR H	Hardware error	Breakdown of temperature sensor used to measure and correct UniBloc sensor temperature characteristics.
		Abnormal data for various correction coefficients for mass display, balance information, and menu setting conditions, etc.
		Weight loader Assy(27) fault
ERR C	Sensitivity calibration error	Calibration weight not placed on the pan. Something else is placed on the pan. The calibration weight is wrong.
ERR N	Numerical input error	Too small a number has been input for reference number settings. Too small a mass has been input for reference percentage settings.
		The password entered is not recognized, when using a function that requires password entry.
ERR W	Operations error	Specific gravity, loading, formulation, or other mode operation error.
COM ERR	External input error	Unidentifiable command code received.
OL		Weight capacity exceeded.
- OL		Measurement pan was removed.
Battery Mark	Power voltage drop	Lights up when voltage supplied to the microcomputer is at or below the specified voltage.
WAIT	Wait for operation approval	
ABORT	Abort	

9.2.2. Service Mode Errors

When entering service mode, detailed error codes are displayed for the errors generated in user mode, as shown in the table below. In this state, press the -> key to display a history of the most recent errors, up to a maximum of five errors.
When more than five errors are displayed, press the -> key to return to the display of the most recent errors.
If entering service mode when no errors have been generated, “NO ERR” is displayed, as shown in the table below.

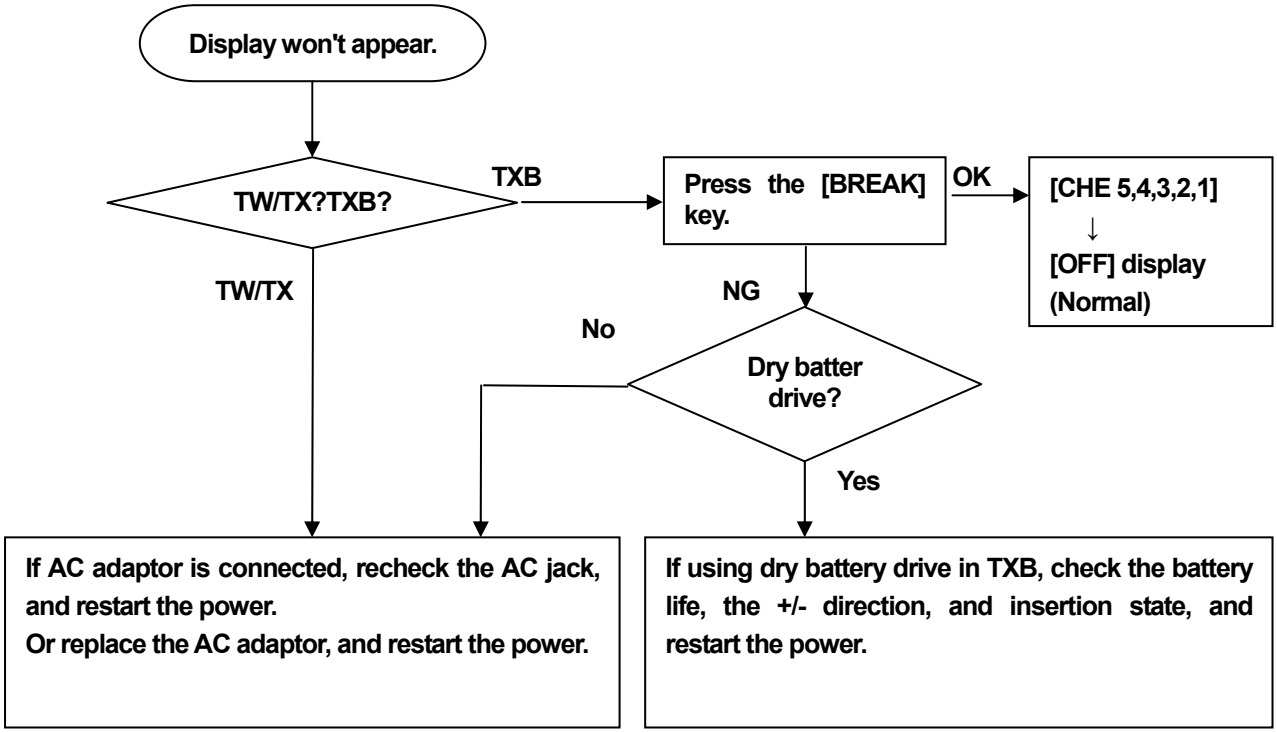
User Mode Error Name	Service Mode Error Name	Display	Description
No Errors	-		No errors occurred during user mode.
System Error (Hardware Error)	Temperature Sensor Error (Err1)		Abnormal temperature data due to temperature sensor malfunction.
	EEPROM Data Error (Err5)		Abnormal mass calculation due to EEPROM data abnormality.
Sensitivity Calibration Error	Stabilization Error (CAL E1)		Measurement value at zero point or weight measurement is unstable.
	Zero Point Error (CAL E2)		Drift from zero point since last sensitivity calibration is large. Object exceeding 20% of weight capacity is placed on the pan, or a change in the zero point equivalent to excess of 20% of weight capacity occurred.
	Span Error (CAL E4)		Difference between the set reference weight value and measured weight span value exceeds 2% of the reference weight mass.

9.2.3. Self check when power is turned on

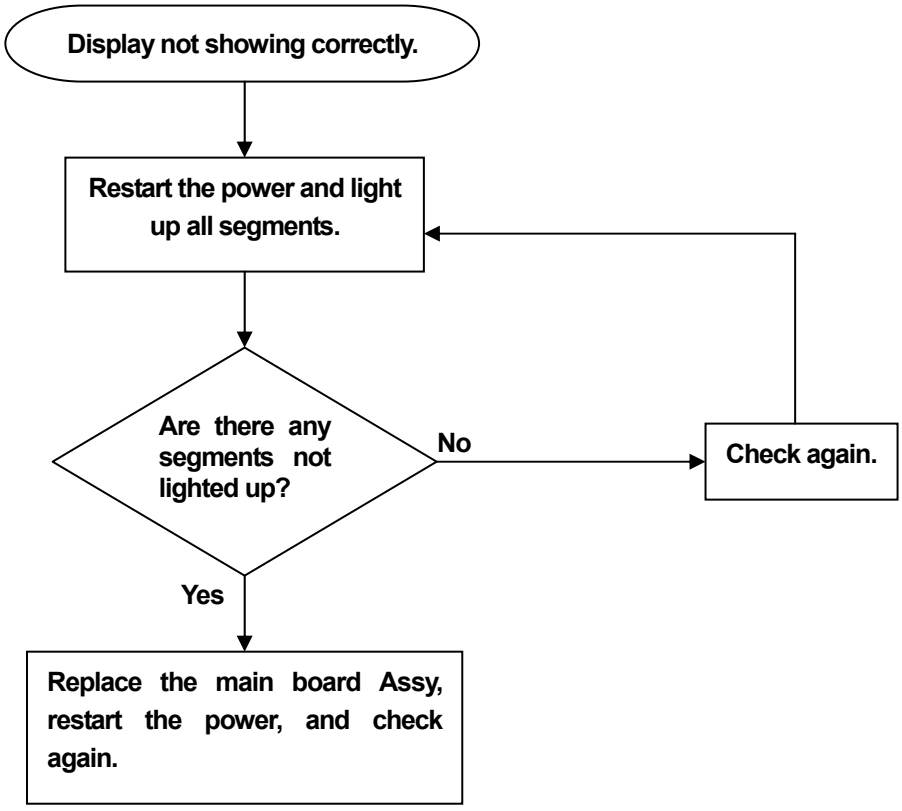
Display		Content of self check
Ver 1.XX.XX.XX	Ver 2.XX.XX.XX ~	
CHE 5	Ver No.	Initializing of AD converter
CHE 4		Check of EEPROM data initializing(in CPU area) operation
CHE 3	CHE 3	Copy of EEPROM data to CPU
CHE 2	CHE 2	Initialize(return to home) of internal CAL system(TW Ver 2.XX~) Temperature sensor(TAD) check
CHE 1	CHE 1	Check of start display (g/OFF/8888)
CHE 0	CHE 0	Preparation of measurement (Weighing-mode, Application function, Communication setting, etc.)

10. Troubleshooting

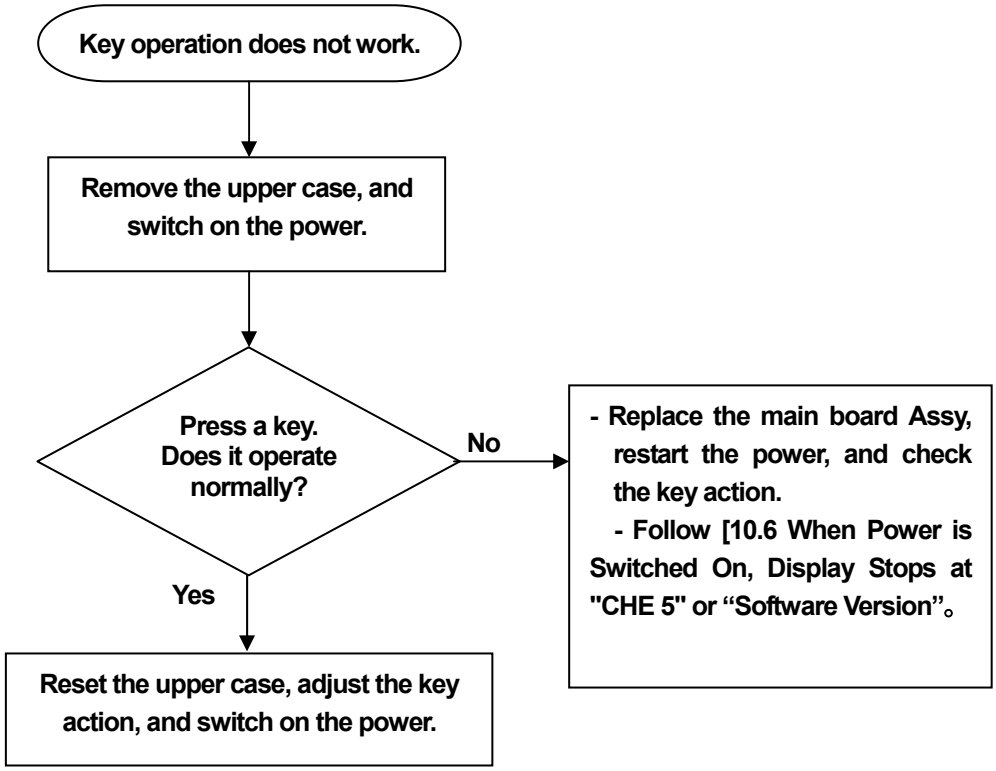
10.1. Display Won't Appear



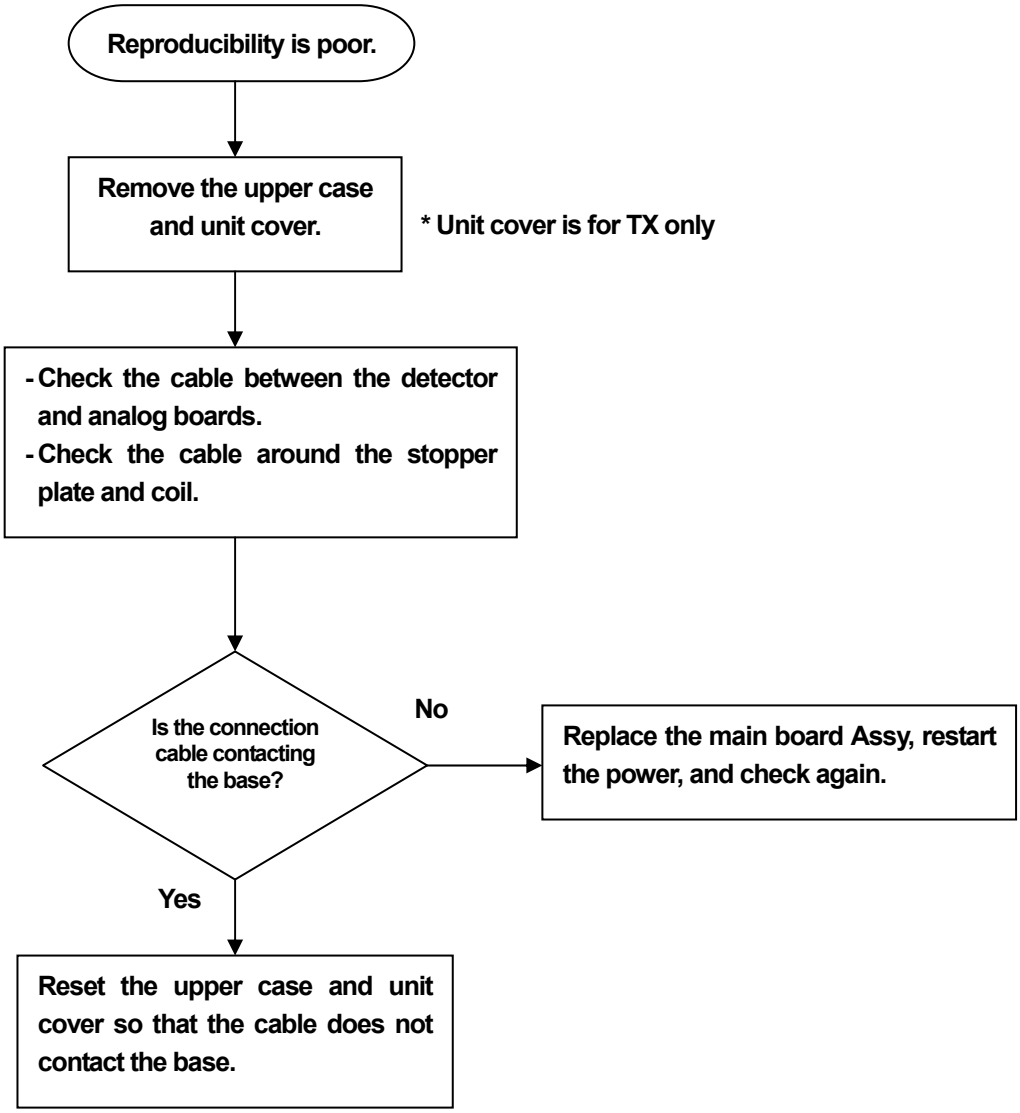
10.2. Display Not Showing Correctly


Display not showing correctly.
Restart the power and light up all segments.
Are there any segments not lighted up?
No
Check again.
Yes
Replace the main board Assy, restart the power, and check again.

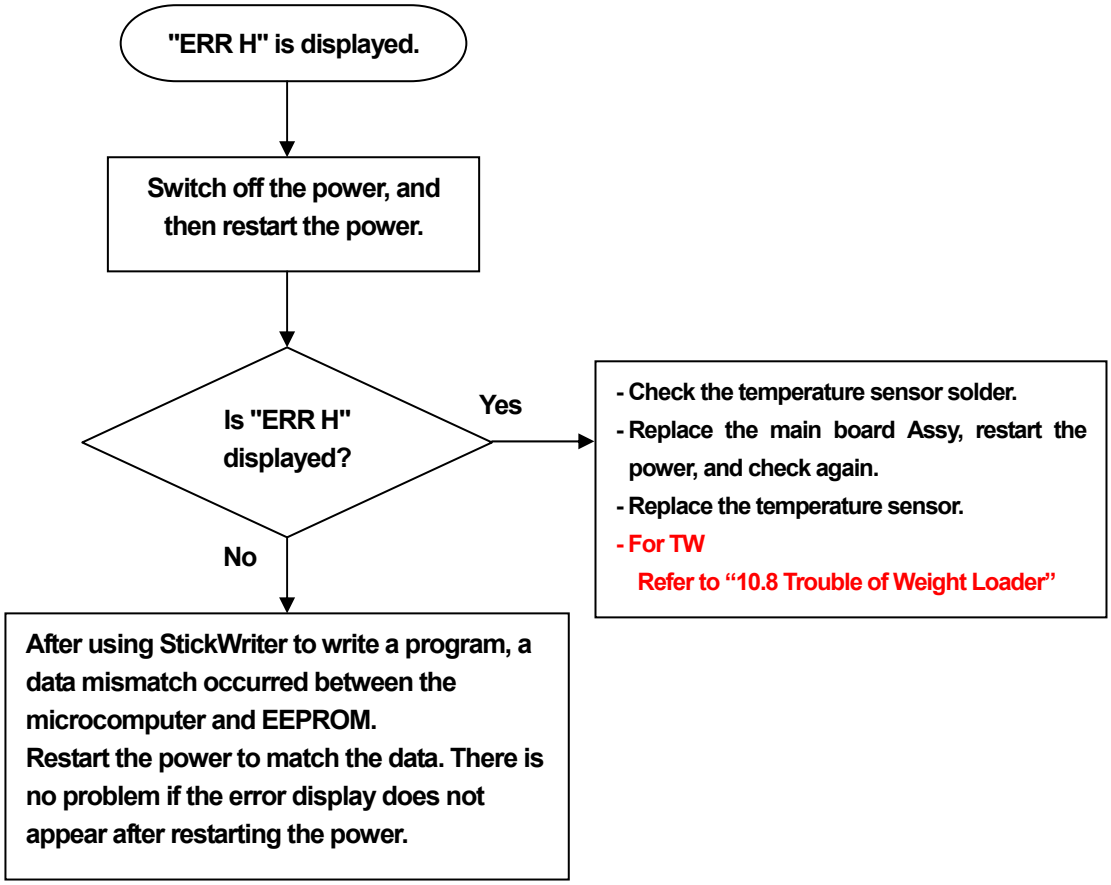
10.3. Key Operation Does Not Work


Key operation does not work.
Remove the upper case, and switch on the power.
Press a key. Does it operate normally?
No
- Replace the main board Assy, restart the power, and check the key action.
- Follow [10.6 When Power is Switched On, Display Stops at "CHE 5" or “Software Version”。
Yes
Reset the upper case, adjust the key action, and switch on the power.

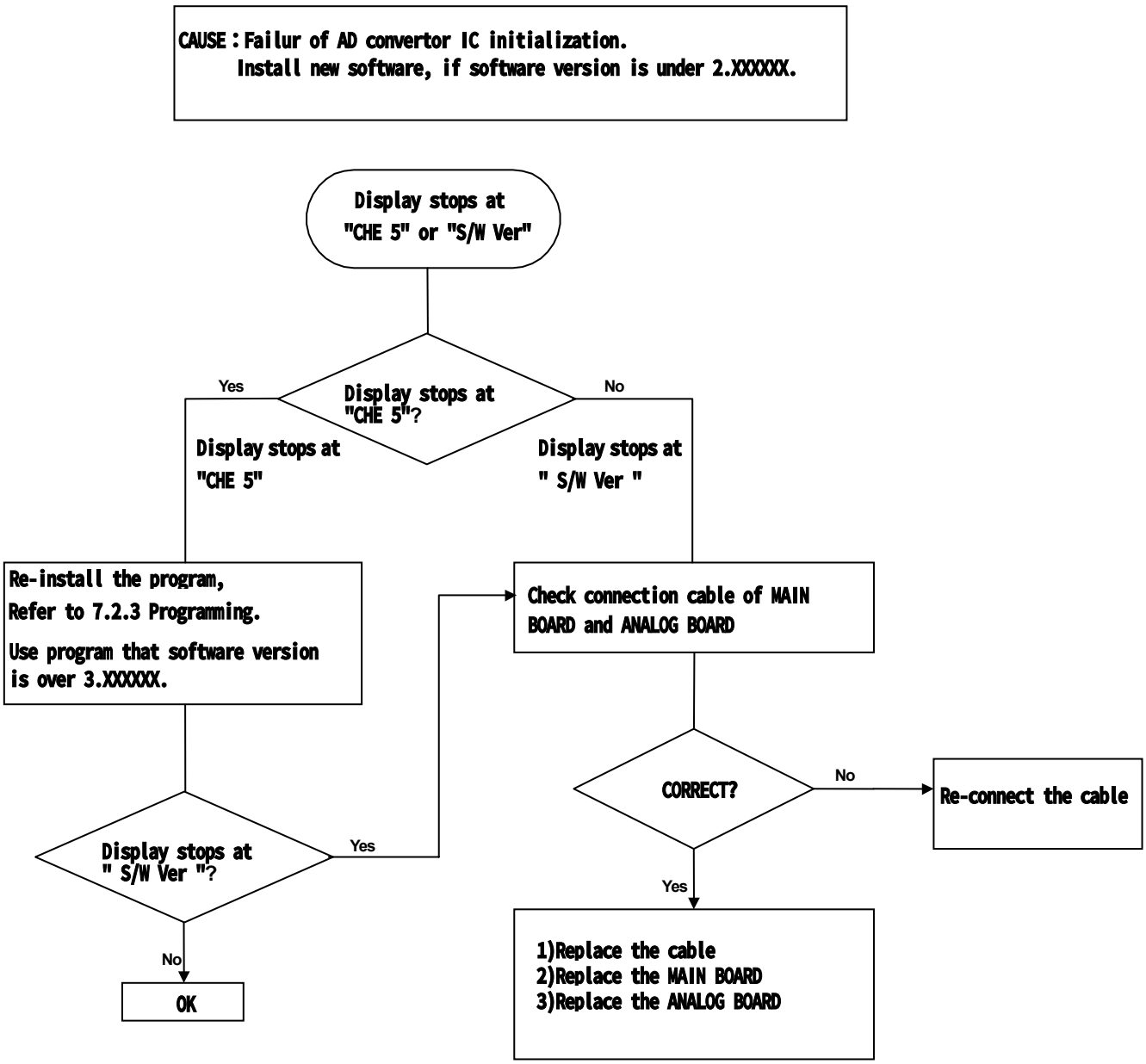
10.4. Poor Reproducibility


Reproducibility is poor.
Remove the upper case and unit cover.
* Unit cover is for TX only
- Check the cable between the detector and analog boards.
- Check the cable around the stopper plate and coil.
Is the connection cable contacting the base?
No
Replace the main board Assy, restart the power, and check again.
Yes
Reset the upper case and unit cover so that the cable does not contact the base.

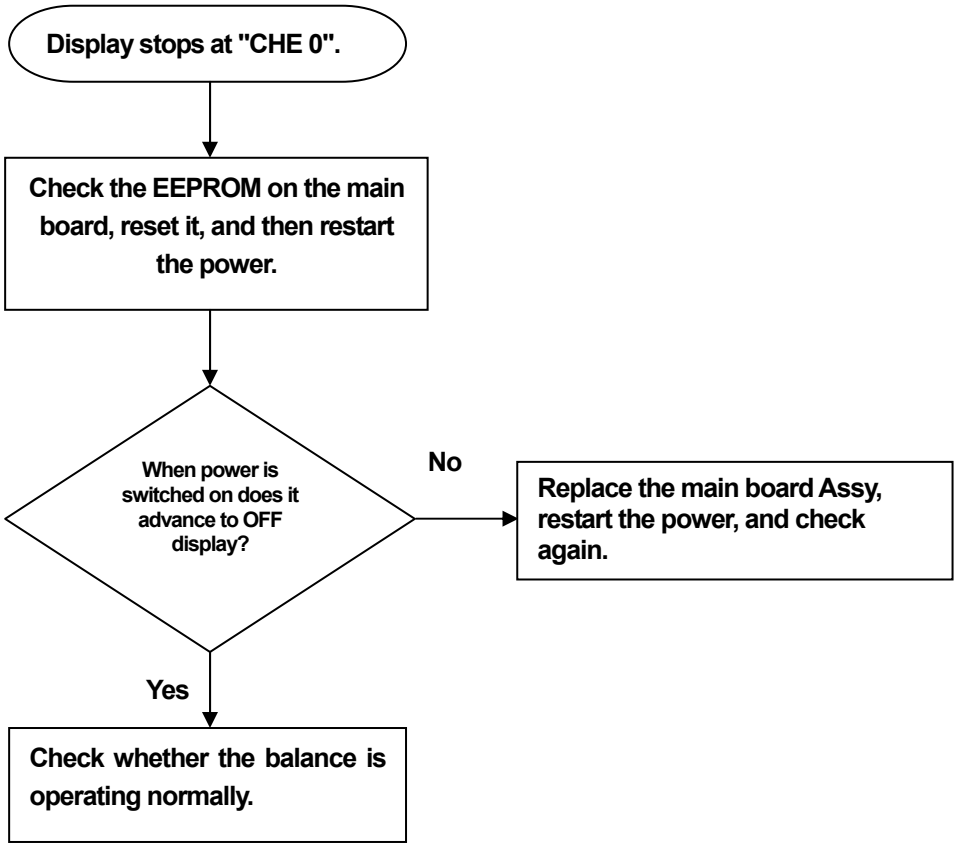
10.5. "ERR H" Is Displayed


"ERR H" is displayed.
Switch off the power, and then restart the power.
Is "ERR H" displayed?
Yes
- Check the temperature sensor solder.
- Replace the main board Assy, restart the power, and check again.
- Replace the temperature sensor.
- For TW
Refer to "10.8 Trouble of Weight Loader"
No
After using StickWriter to write a program, a data mismatch occurred between the microcomputer and EEPROM.
Restart the power to match the data. There is no problem if the error display does not appear after restarting the power.

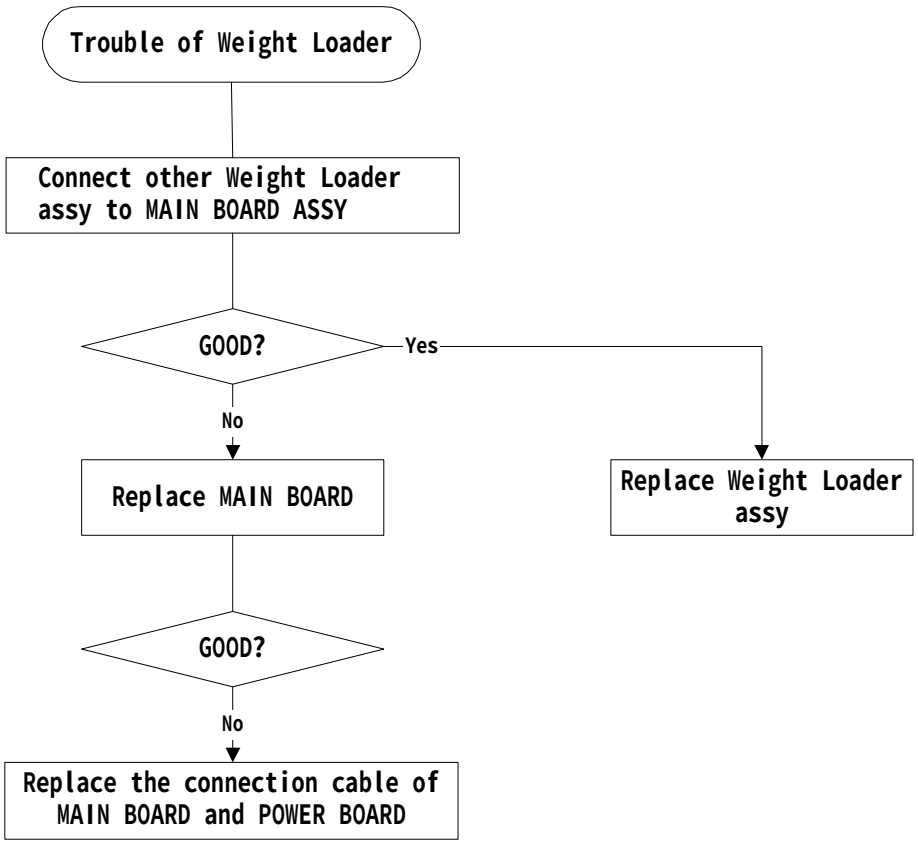
10.6. When Power is Switched On, Display Stops at "CHE 5" or “Software Version”


CAUSE : Failur of AD convertor IC initialization.
Install new software, if software version is under 2.XXXXXX.
Display stops at "CHE 5" or "S/W Ver"
Display stops at "CHE 5"?
Yes
No
Display stops at "CHE 5"
Display stops at " S/W Ver "
Re-install the program, Refer to 7.2.3 Programming.
Use program that software version is over 3.XXXXXX.
Check connection cable of MAIN BOARD and ANALOG BOARD
Display stops at " S/W Ver "?
Yes
No
OK
CORRECT?
No
Re-connect the cable
Yes
1)Replace the cable
2)Replace the MAIN BOARD
3)Replace the ANALOG BOARD

10.7. When Power is Switched On, Display Stops at "CHE 0"


Display stops at "CHE 0".
Check the EEPROM on the main board, reset it, and then restart the power.
When power is switched on does it advance to OFF display?
No
Replace the main board Assy, restart the power, and check again.
Yes
Check whether the balance is operating normally.

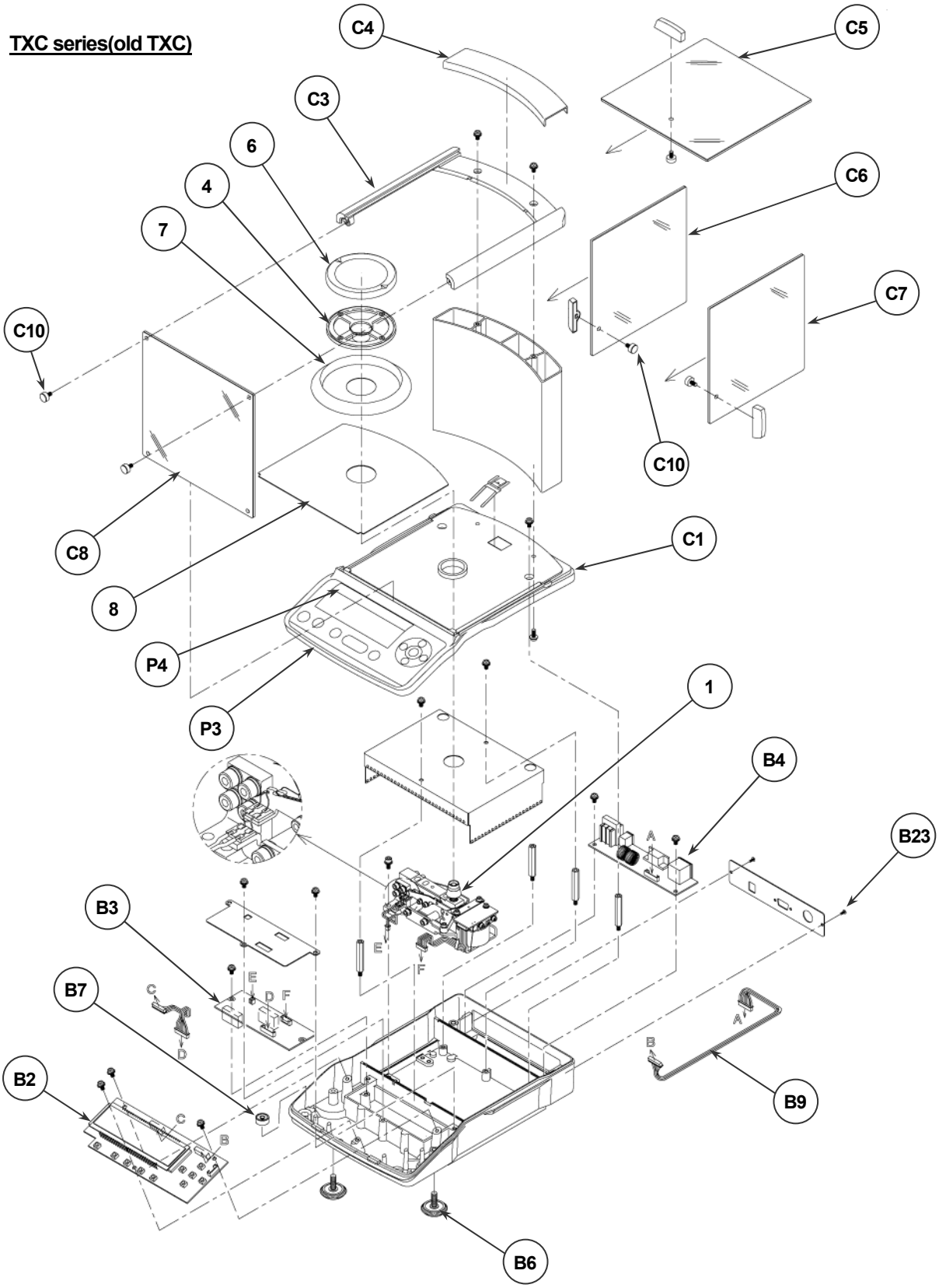
10.8. Trouble of Weight Loader



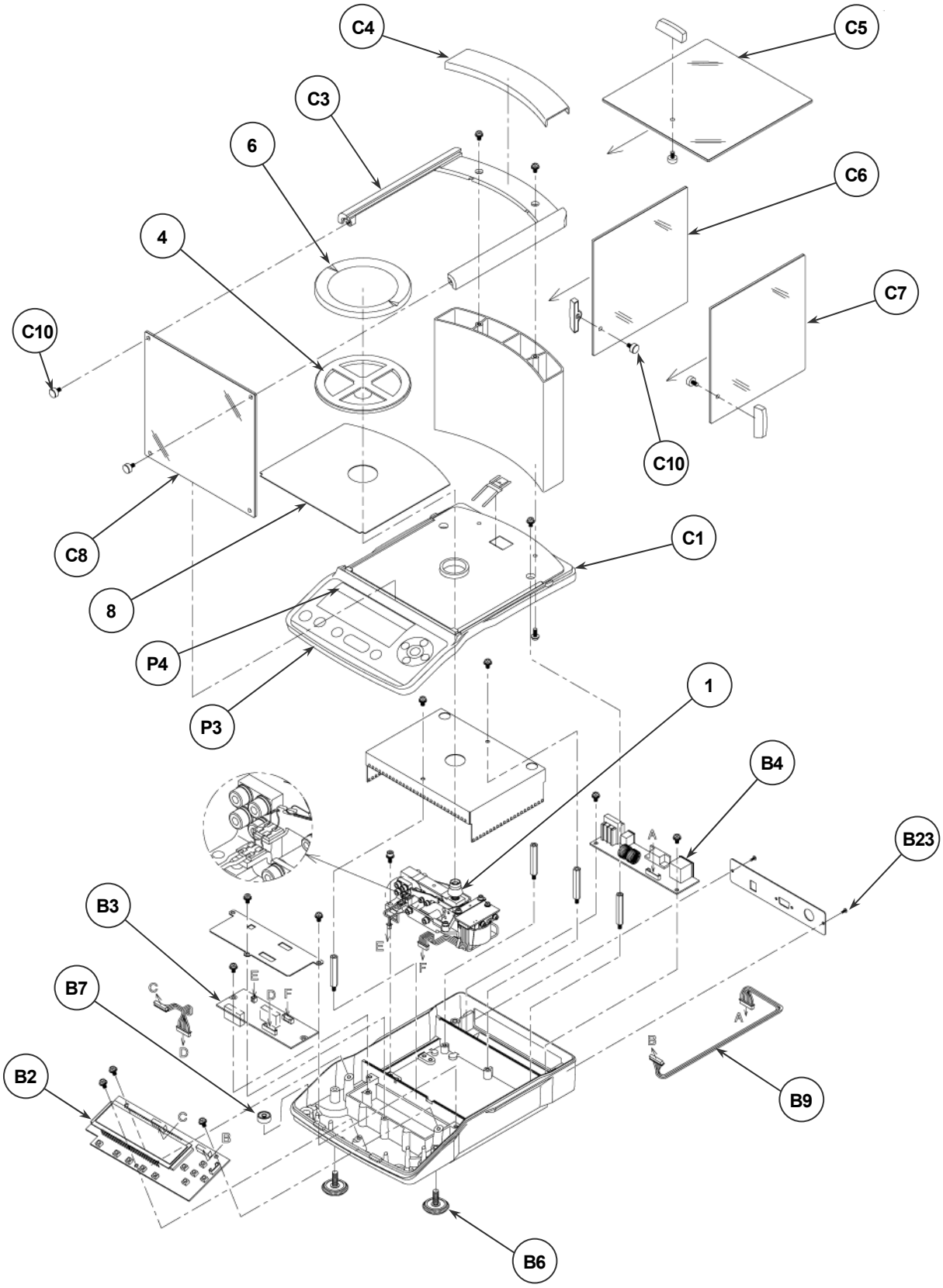
11. Components List

11.1. TW/TWC,TX/TXC series

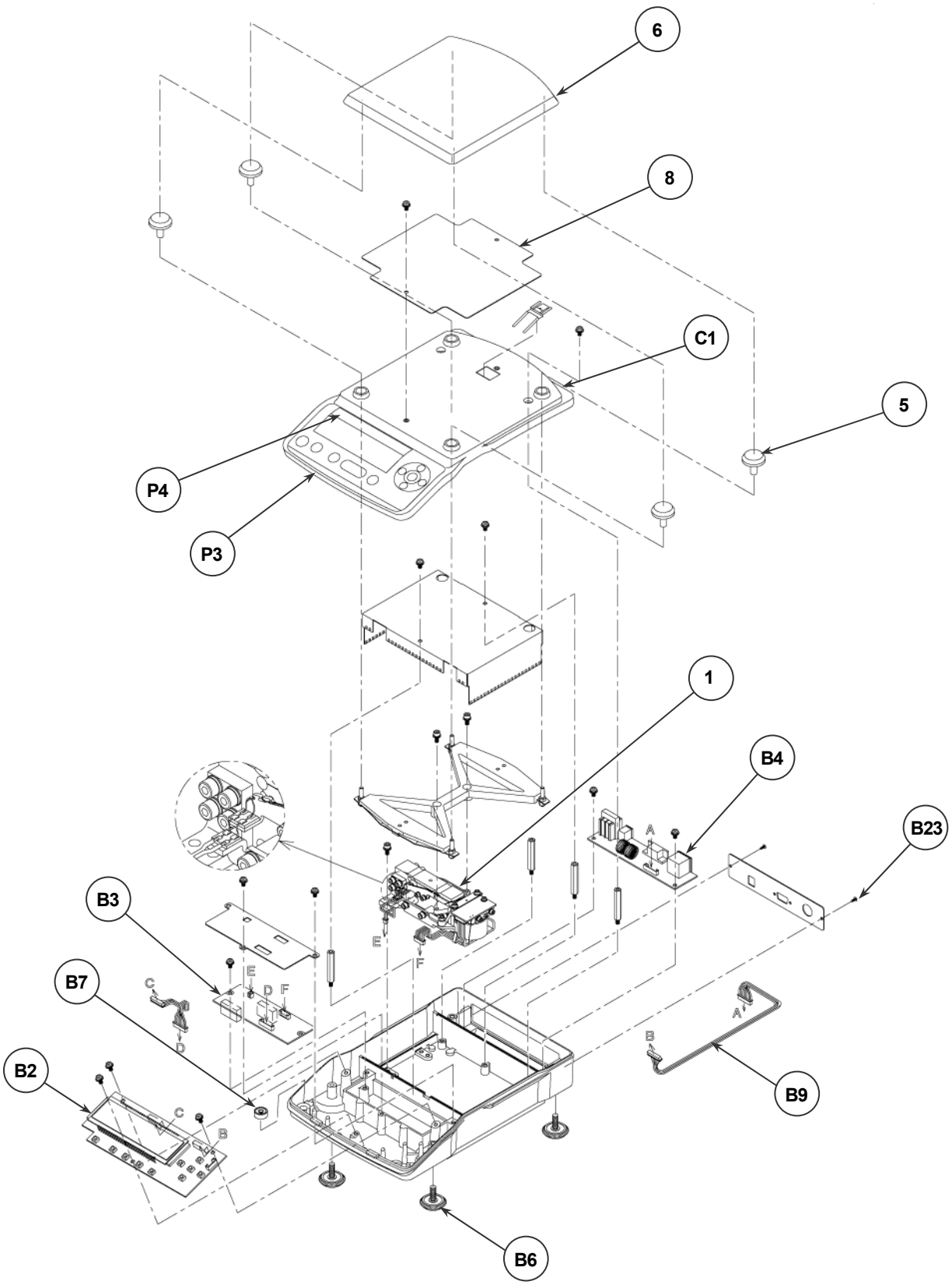
11.1.1. TW/TWC,TX/TXC exploded view



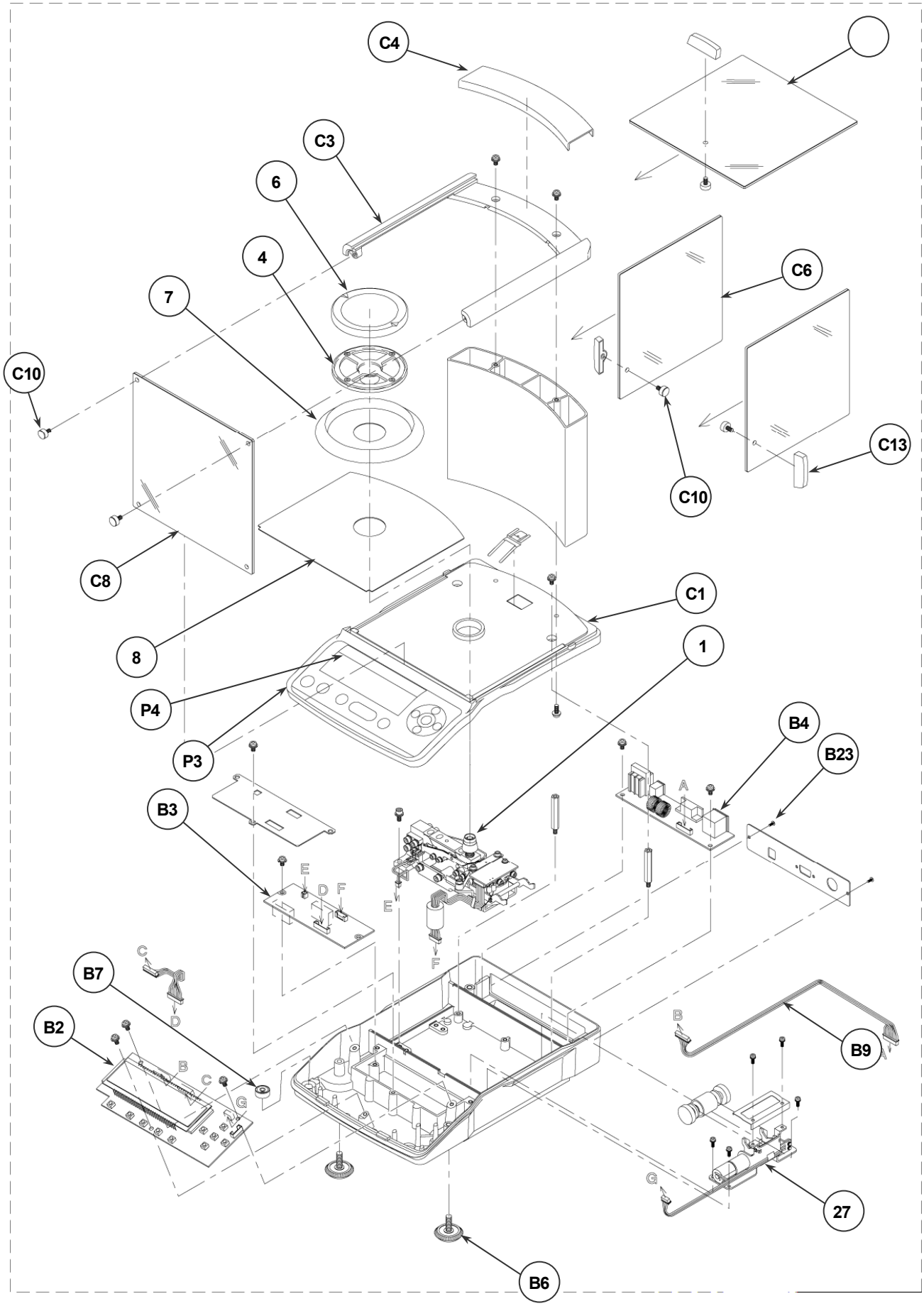
TX series (old small pan)



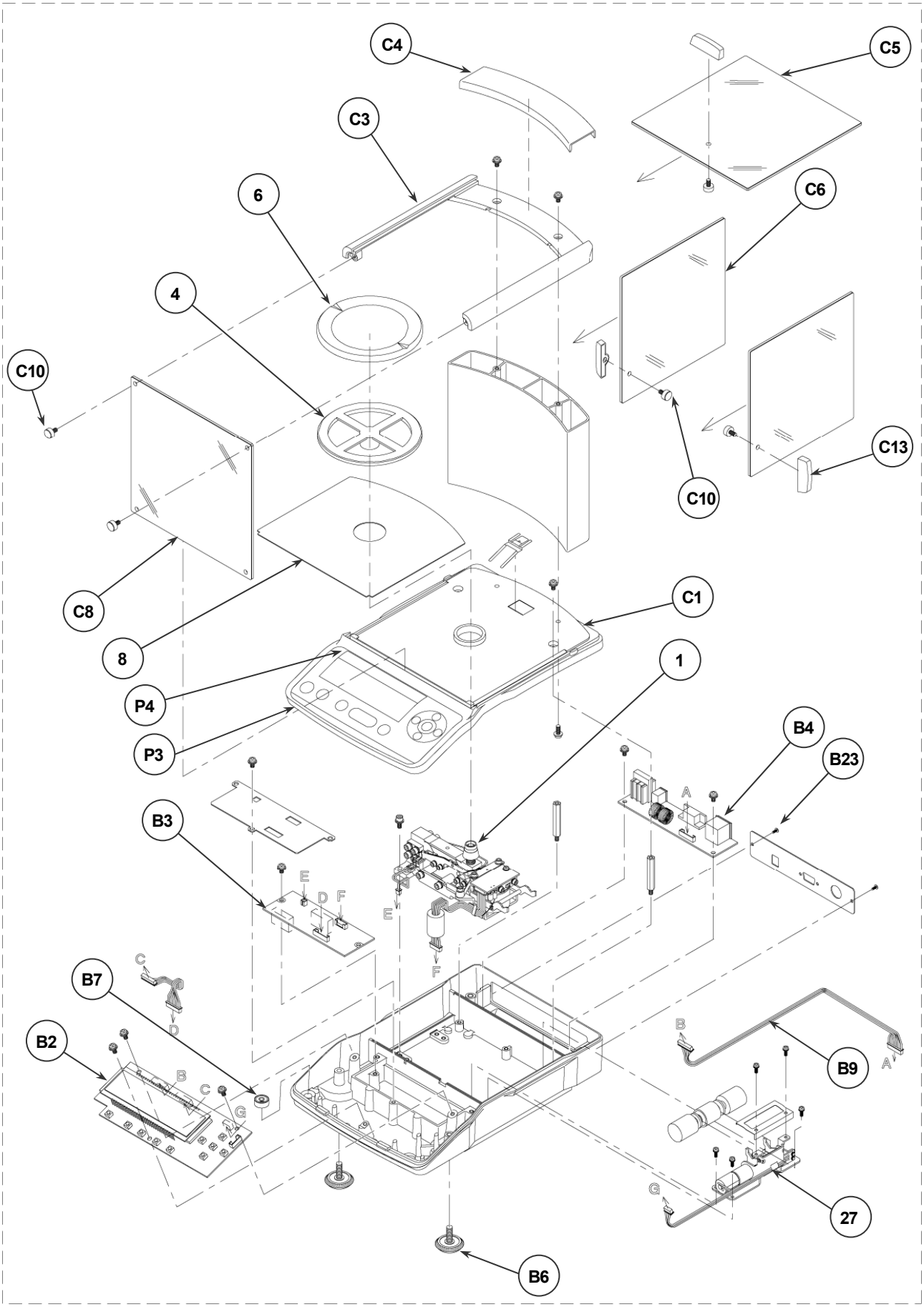
TX series (old large pan)



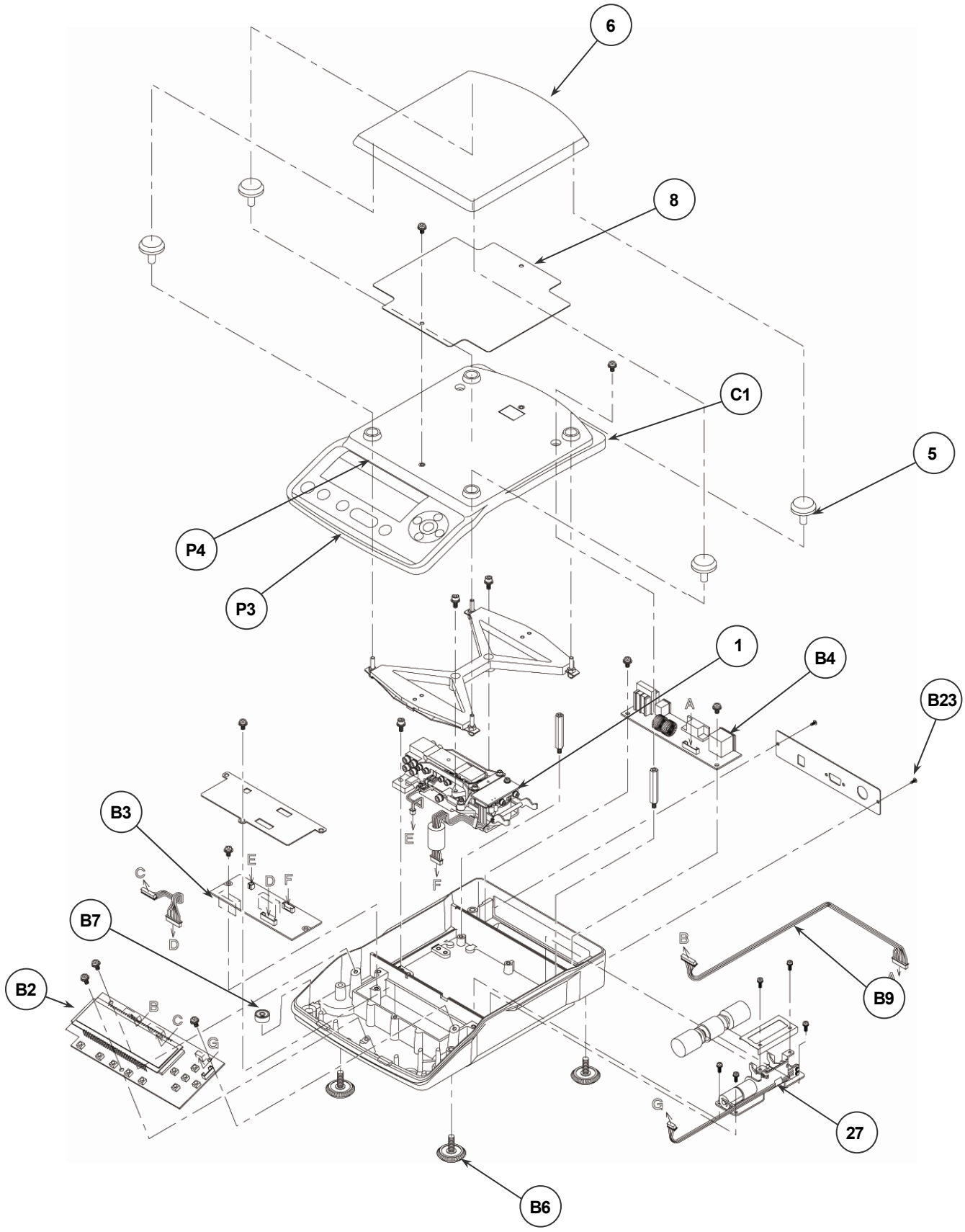
TWC/TXC series (TWC/TXC common)



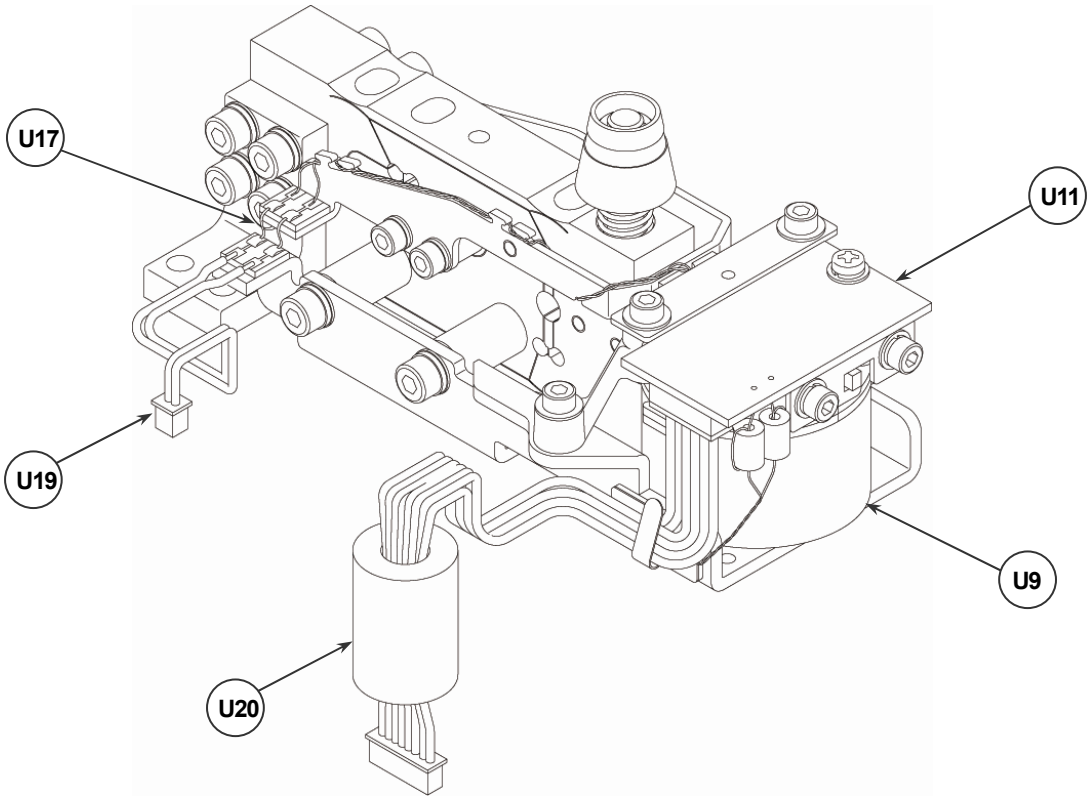
TW/TX series (TW/TX common, small)



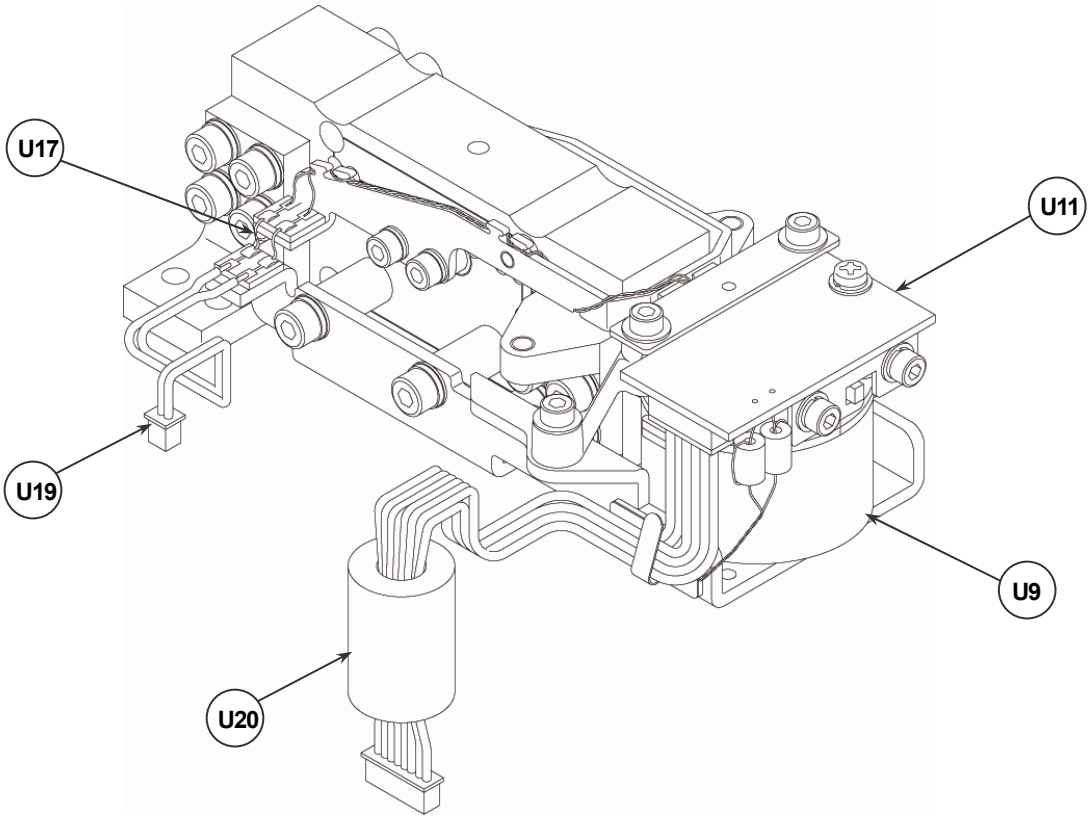
TX series（Large）



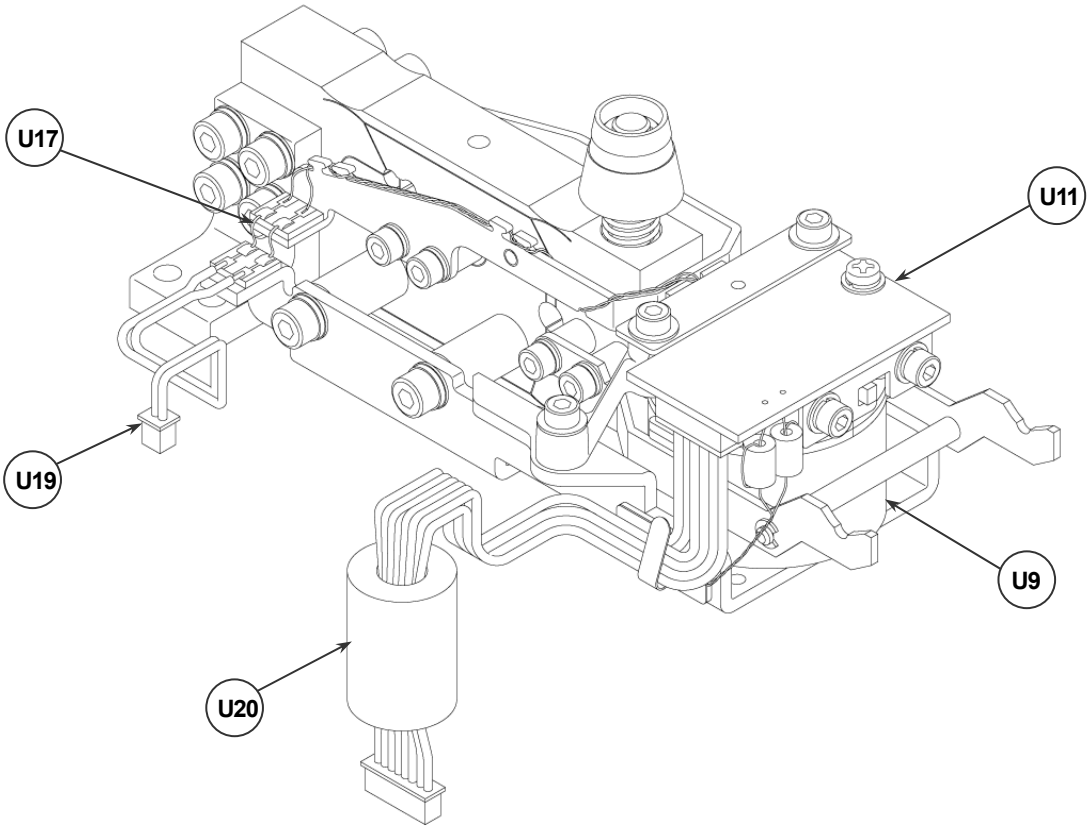
TX series (unit assv(carat/small pan)(1))



TX series (unit assv (large pan)(1))



TW series （unit assy(carat/small pan)(1)）



TW/TWC/TX/TXC Series Maintenance Parts

No.	Product name	P/N	TXC		TX		TWC	TW		Ref.
			323 (*4)	323/ 623	Small pan	Large pan	323/ 623	Small pan		
1	Unit assy, TX (carat)	321-64620-01	✓							*1,*9 TXC323L only
	Unit assy, TX (small)	321-64620-02			(✓)					*1,*9 TX223L/323L only
	Unit assy, TX (large)	321-64620-03				✓				*1
	Unit assy, TXC623L	321-64620-04	✓	✓						*1,*10 TXC common
	Unit assy, TX423L	321-64620-05			✓					*1, *10 TX(small)common
	Unit assy, TW (carat)	321-64620-21					✓			*1
	Unit assy, TW (small)	321-64620-22						✓		*1
	~~Unit assy, TW (large)~~	~~321-64620-23~~								*1
4	Pan support assy, carat	321-64518	✓							*4(old TXC323L)
	Pan support , carat	321-64588		✓			✓			
	Pan support, small pan	321-64589			✓			✓		
5	Cap, pan support	321-64591				✓				
6	Pan (φ80)	321-41225	✓	✓			✓			
	Pan (φ110)	321-41418-10			✓			✓		
	Pan, large	321-64587				✓				
7	Wind shield ring	321-41205-11	✓	✓			✓			
8	Cover plate, carat/small pan	321-64593	✓	✓	✓		✓	✓		
	Cover plate, large pan	321-64594				✓				
27	Weight loader assy,TW	321-70965					✓	✓		
B2	Main board assy	321-64553-01	(✓)		(✓)	(✓)				*2,*5TX only ver. 1.00.XX.XX
	Main board assy	321-64553-03	✓	✓	✓	✓	✓	✓		*6TW/TX common ver. 2.00.XX.XX
	Main board assy (TXC623L)	321-64553-14		(✓)						*5 old TXC623L only ver. 1.00.XX.XX
	Main board assy	321-64553-05	✓	✓	✓	✓	✓	✓		TW/TX common ver. 3.00.XX.XX
	SW,TACT PTM114NN	064-48205-21	✓	✓	✓	✓	✓	✓		
	LCD,EDC6671 TRANSFL	321-63860-02	✓	✓	✓	✓	✓	✓		
	BACKLIGHT,EDM6671	321-63861	✓	✓	✓	✓	✓	✓		*Compatible
	BACKLIGHT,EDM8070	321-71121	✓	✓	✓	✓	✓	✓		*Compatible
B3	Analog board assy (TXC323L)	321-64556-13	(✓)							*4(oldTXC323L),*1
	Analog board assy (TXC623L)	321-64556-14		✓			✓			*1
	Analog board assy (small)	321-64556-11			✓			✓		*1
	Analog board assy (large)	321-64556-12				✓				*1
B4	Power board assy	321-64550	(✓)	(✓)	(✓)	(✓)				*5TX only
	Power board assy	321-64550-01	✓	✓	✓	✓	✓	✓		*6TW/TX common
B6	Level adjuster assy	321-64540	✓	✓	✓	✓	✓	✓		
B7	Level assy	321-70691-01	✓	✓	✓	✓	✓	✓		*3
B9	Cable, ILS 10S-10S-300	321-64566-03	(✓)	(✓)	(✓)	(✓)				*5TX only
	Cable, ILS 11S-11S-440	321-64566-05	✓	✓	✓	✓	✓	✓		*6TW/TX common
	Cable, ILS 10S-11S-440	321-64566-06	(✓)	(✓)	(✓)	(✓)	(✓)	(✓)		*7 PCBA between TX only- TW/TX common
B23	Screw, hex socket button M3X6(Rear)	022-66298-01	✓	✓	✓	✓	✓	✓		
C1	Case, carat/small pan	321-64576-11	✓	✓	✓		✓	✓		*1
	Case, large pan	321-64577-11				✓				*1
C3	Case roof	321-64579-01	✓	✓	✓		✓	✓		
C4	Cover, case roof	321-64580	✓	✓	✓		✓	✓		
C5	Roof glass	321-64582	✓	✓	✓		✓	✓		
C6	Side glass	321-64584	✓	✓	✓		✓	✓		
C8	Glass, front	321-64601	✓	✓	✓		✓	✓		
C10	Knob	321-62787-01	✓	✓	✓		✓	✓		
C13	Handle assy	321-64619	✓	✓	✓		✓	✓		

No.	Product name	P/N	TXC		TX		TWC	TW		Ref.
			323 (*4)	323/ 623	Small pan	Large pan	323/ 623	Small pan		
P3	Sheet panel, TX matt	321-64541	✓	✓	✓	✓	✓	✓		*8
	Sheet panel, TX clear	321-64541-01	✓	✓	✓	✓	✓	✓		*11
P4	Label type name, TX223L	321-64542-02			✓					
	Label type name, TX323L	321-64542-03			✓					
	Label type name, TX423L	321-64542-04			✓					
	Label type name, TX2202L	321-64542-12				✓				
	Label type name, TX3202L	321-64542-13				✓				
	Label type name, TX4202L	321-64542-14				✓				
	Label type name, TXC323L	321-64542-21	✓							
	Label type name, TXC623L	321-64542-22		✓						
	Label type name, TW223L	321-64542-07						✓		
	Label type name, TW323L	321-64542-08						✓		
	Label type name, TW423L	321-64542-09						✓		
	~~Label type name, TW2202L~~	~~321-64542-17~~								
	~~Label type name, TW3202L~~	~~321-64542-18~~								
	~~Label type name, TW4202L~~	~~321-64542-19~~								
	Label type name, TWC323L	321-64542-26					✓			
	Label type name, TWC623L	321-64542-27					✓			
L1	Force coil assy	321-53912-10	✓	✓	✓	✓	✓	✓		
U9	Magnet assy	321-55222-12	✓	✓	✓	✓	✓	✓		
U11	Assy, detector	321-64559	✓	✓	✓	✓	✓	✓		
U17	Pt-Ni band 1MT	321-70188-01	2× 15mm	2× 15mm	2× 15mm	2× 15mm	2× 15mm	2× 15mm		014-54301 1m
U19	Cable, ILS 7S-7S-130	321-64566-04	✓	✓	✓	✓	✓	✓		*1
U20	Cable, ILS 2S-90	321-64567-01	✓	✓	✓	✓	✓	✓		

(*1) These parts are for CE type. It can use also for non-CE type.

(*2) Main board is common to CE and non CE analog board.

(*3) Setting of Level assv needs Bond. In the case of shipment, use the bond of Araldite rapid Type.

(*4) After 2009/9 shipment, Change TXC323L H/W to common design to TXC623L.

Need to change marked items together, since there is not compatible with them.

(*5)PCBA for old TX series only. Stock service parts is shifted to items *6. Items except *7 cable is compatible.

(*6)PCBA for new TW/TX common. If each of main board assy or power board assy is changed on old TX sereis, need cable *7 to connect them

(*7)Cable to connect between PCBA for old TX only and PCBA for TW/TX common.

(*8)If sheet panel is changed, need to change label typename also.

(*9Unit assy for old TXC/TX(TXC323L,TX223L,TX323L) series only) Stock service parts is shifted to items *10. Items

(*10) Unit assy for new TXC common and TX(small) common

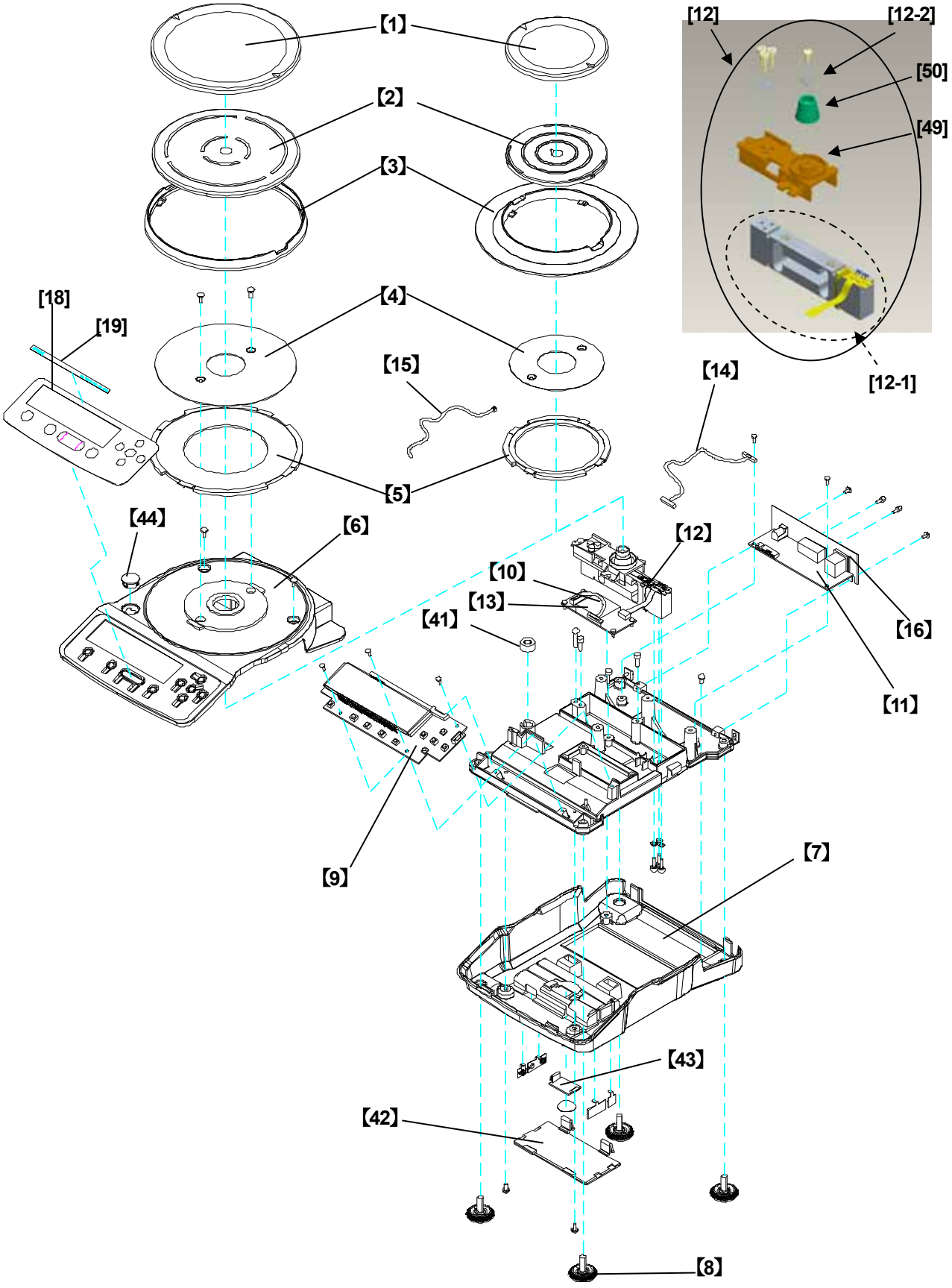
(*11) Stock service parts shift from matt type to clear type.

11.1.2. TX/TXC series dedicated jigs

No.	Product name	P／N	Remarks
J1	Lever fixing pin	321-62674	Common with UX
J2	Unit assy positioning jig	774-41708	
J3	Gap setting shim(t=0.2)	321-69034	Common with UX
J4	Handle for corner load adjustment	321-69205	Common with UX
J5	Grind stone	321-69206	Common with UX
J8	Pin, weight loader	774-41784	Positioning jig for TW unit and weight loader
J9	Jig bloc, weight loader arm	774-41785	Positioning jig for TW unit and weight loader
J10	RS-232Ccable(9P-9P)	321-61967	
J11	Flash programmer,SW-K0LX2	774-49154	
J12	Cable,, Program writer	774-41751	
J13	TORQ driver 50LTD	321-69121-07	Common with UX
J14	Hexagon bit SB3	321-69121-11	Common with UX
J15	Hexagon bit SB2.5	774-49034-01	Common with UX
J16	Check wire set	321-62356	Common with UX

11.2. TXB Series

11.2.1. TXB exploded view



11.2.2. TXB Series Maintenance Parts

No.	Product name	P/N	Large Pan	Small Pan	Remarks
1	PAN L	321-63871	1		
	PAN S	321-41418-10		1	
2	TRAY L	321-63873	1		
	TRAY S	321-63835		1	
3	PAN RING L	321-63830	1		
	PAN RING S	321-63831		1	
4	TRAY PLATE L	321-63872-01	1		
	TRAY PLATE S	321-63872-02		1	
5	RING SPACER L	321-63832	1		
	RING SPACER S	321-63833		1	
6	UPPER COVER	321-63836	1	1	
7	BOTTOM COVER	321-63837	1	1	
8	LEVEl ADJUSTER	321-64540	4	2	
9	DISPLAY BOARD ASSY	321-63850	1	1	
	SW,TACT PTM114NN	064-48205-21	10	10	
	LCD,EDC6671 TRANSFL	321-63860-02	1	1	
	BACKLIGHT,EDM6671	321-63861	1	1	
10	ANALOG BOARD ASSY	321-63845-01	1	1	CE
11	POWER BOARD ASSY	321-63855	1	1	
12	LOADCELL ASSY	321-64700-04	1		With tray hanger & shaft
	LOADCELL ASSY	321-64700-03		1	With tray hanger & shaft
12-1	LOADCELL ASSY	321-64700-12	1		Without tray hanger & shaft
	LOADCELL ASSY	321-64700-11		1	Without tray hanger & shaft
12-2	SPRING EARTH	321-63880		1	
(*2)	ADOVANCE WIRE, UE-CN0.3-50	320-00067-51	1	1	50cm
	ADOVANCE WIRE, UE-CN0.3-100	320-00067-52	1	1	100cm
	ADOVANCE WIRE, UE-CN0.3-200	320-00067-53	1	1	200cm
13	CABLE ILS1	321-63859-01	1	1	
14	CABLE ILS2	321-63859-02	1	1	
15	CABLE EH	321-63858	1	1	
16	BACK PLATE	321-63874	1	1	
17	BASE ASSY	321-63820-02	1		-04 for CE
	BASE ASSY	321-63820-01		1	-03 for CE
18	SHEET PANEL_TXB	321-63811	1	1	
19	MODEL NAME LABEL,TXB621L	321-63812-01	1		For TXB621L
	MODEL NAME LABEL,TXB222L	321-63812-02	1		For TXB222L
	MODEL NAME LABEL,TXB422L	321-63812-03	1		For TXB422L
	MODEL NAME LABEL,TXB622L	321-63812-04	1		For TXB622L
	MODEL NAME LABEL,TXB6200L	321-63812-11		1	For TXB6200L
	MODEL NAME LABEL,TXB2201L	321-63812-12		1	For TXB2201L
	MODEL NAME LABEL,TXB4201L	321-63812-13		1	For TXB4201L
	MODEL NAME LABEL,TXB6201L	321-63812-14		1	For TXB6201L
21	SCREW,SST FLAT HEAD M4X10	020-12126	2	2	
22	SCREW,SST SEMS P3 M4X8	020-46547	4	4	
22	SCREW,SST SEMS P2 M4X8	020-46147	2	2	
23	SCREW,SST SEMS P4 M3X8	020-46635	2	2	
24	SCREW,SST TRUSS HEAD M3X6	020-37043	2	2	
25	LOCK SCREW,HEX-11.8	070-02898-91	2	2	
26	BOLT,SST HEXSOCKET M4X12	022-27045	6	6	
41	LEVEL ASSY (*1)	321-70693-03	1	1	
42	DRYCELL COVER	321-63838	1	1	
43	SWITCH COVER	321-63869	1	1	
44	LEVEL WINDOW	321-63839	1	1	
45	CONTACT, 288C ANODE	074-70914-01	1	1	
46	CONTACT, 288C CATHODE	074-70914-02	1	1	
47	CONTACT, 288C ANODE-CATHODE	074-70914-03	1	1	
48	CONTACT, 288C CATHODE-ANODE	074-70914-04	1	1	
49	TRAY, HUNGER	321-63876	1	1	
50	SHAFT, PAN	321-63868	1	1	

(*1) Setting of Level assv needs Bond. In the case of shipment, use the bond of Araldite rapid Type.

(*2) ϕ0.3mm: 0.069 Ohm/cm (0.2mV/cm)

11.2.3. TXB series dedicated jigs

No	品名	P/N	備考
1	CELL ASSY SETTING JIG	774-41712	
2	SPACER 0.4	774-41713-01	For the adjust of overweighing 0.4mm
3	SPACER 0.6	774-41713-02	For the adjust of overweighing 0.6mm

11.3. TW/TX/TXB Series Shared Jigs and Tools

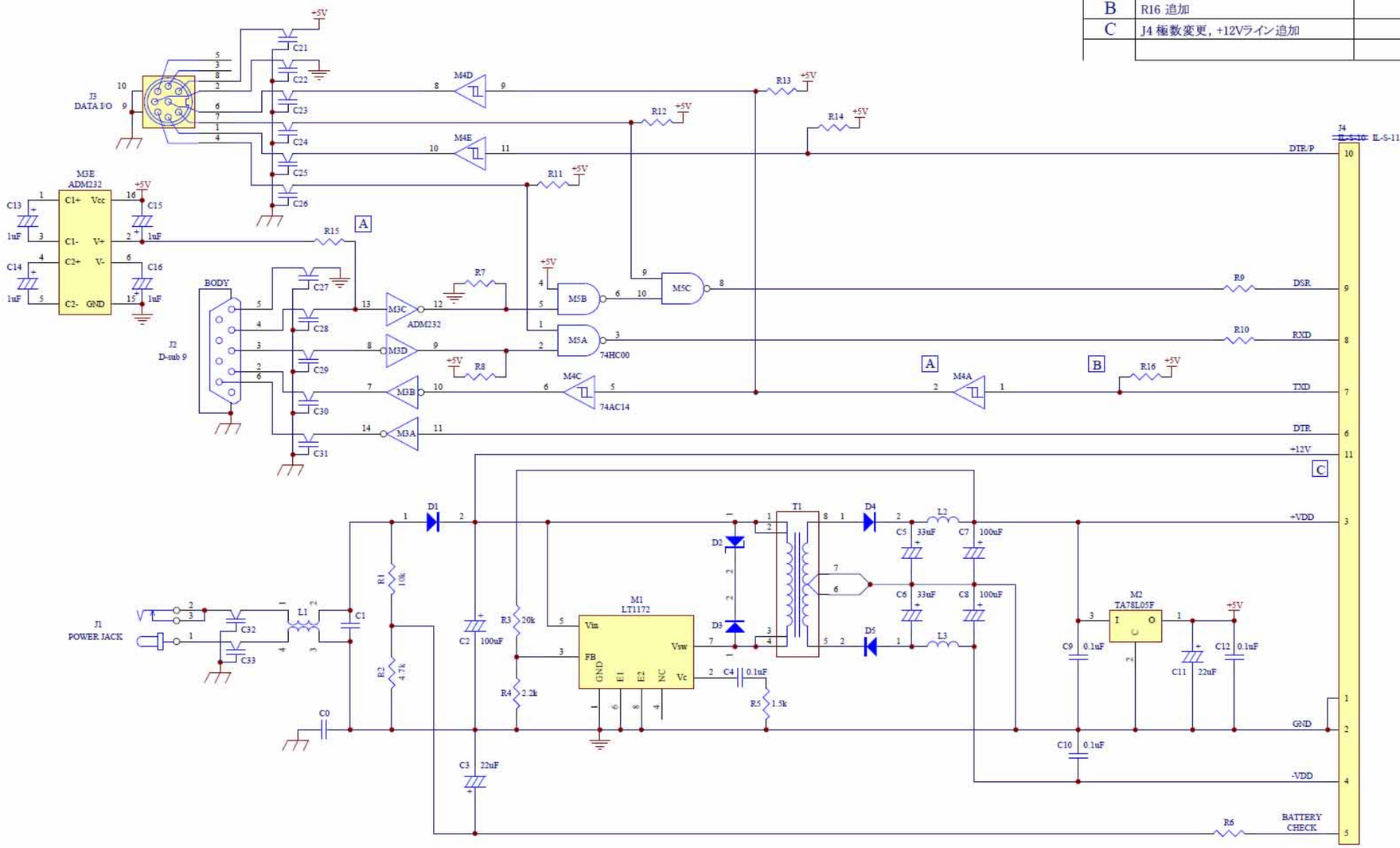
No.	Product name	P／N	Remarks
1	Flash programer SW-K0LX2	774-49154	Common jigs with TW/TX/TXB
2	Cable, program writer	774-41751	Common jigs with TW/TX/TXB
J6	Check wire set	321-62356	
	Torque driver N12LTDK(for M2.5)	774-49033-04	
	Torque driver N30LTDK(for M3,M4)	774-49033-02	
	Torque driver N50LTDK(for M4hex socket)	774-49033-03	
	Hex bit SB2.5(for M3)	774-49034-01	
	Hex bitSB3(for M4)	321-69121-11	
	Box driver #5(for #4-40UNC)	086-12003	
	Box driver #7(for M4)	086-12005	
	Spaner 5.5×7(for M3/M4)	086-03050	
	Spaner Hex 0.9	086-03801-12	TW weight loader
	Ball driver BS1.5(for M2 hex socket button)	086-12021	TW weight loader
	Ball driver BS2(for M3 hex socket button)	086-12022	
	Ball driver BS2.5(for M3 kex socket)	086-12023	
	Ball driver BS3(for M4 hex socket)	086-12024	
	Sordering iron FX-951-01(for Pb free)	086-72039-01	
	Soldering,P3M705-0.8(Pb free)	018-52130-03	
	Digital Multimeter(+/- 5V)		

TW/TWC TX/TXC POWER BOARD CIRCUIT (1/3)

S-1113B

088-00703-01

改定 REV	改定内容 DESCRIPTION	EC NO.	日付 DATE	担当 SIGN
A	回路一部 見直し		2007- 5- 7	友 田
B	R16 追加		2007- 6-27	友 田
C	J4 極数変更，+12Vライン追加		2009- 3- 5	藤 田



作成 DATE 06-11-17	担当 DEPT B A	DIM:mm	図面名称(和文) カイロズ，デンゲンキバン	
作成 DSG 友 田 K.TOMODA	検討 CHK	承認 APP	尺度 SCALE	TITLE，ENGLISH CIRCUIT，POWER BOARD
⊕ 島津製作所 SHIMADZU CORPORATION KYOTO JAPAN			DWG SIZE A3	図面番号 DWG NO. 321-64551 SHEET 1/1 改定 REV C

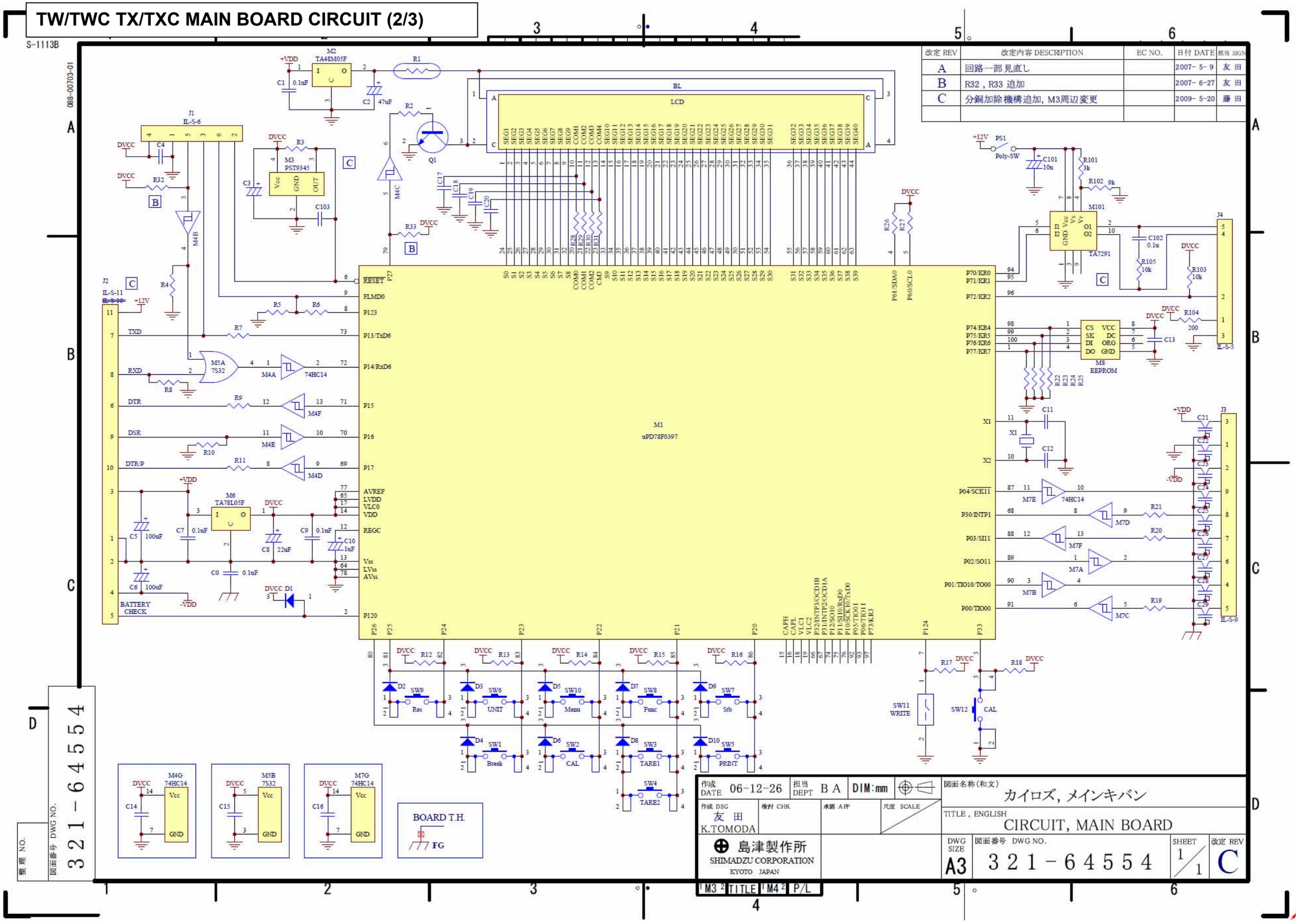
整理 NO. 図面番号 DWG NO. 321-64551

TW/TWC TX/TXC MAIN BOARD CIRCUIT (2/3)

S-1113B

088-00703-01

改定 REV	改定内容 DESCRIPTION	EC NO.	日付 DATE	担当 SIGN
A	回路一部見直し		2007- 5- 9	友 田
B	R32 , R33 追加		2007- 6-27	友 田
C	分銅加除機構追加, M3周辺変更		2009- 5-20	藤 田



作成 DATE	06-12-26	担当 DEPT	B A	DIM:mm	図面名称(和文) カイロズ, メインキバン
作成 DSG	友 田 K.TOMODA	検討 CHK		尺度 SCALE	TITLE , ENGLISH CIRCUIT, MAIN BOARD
⊕ 島津製作所 SHIMADZU CORPORATION KYOTO JAPAN				DWG SIZE A3	図面番号 DWG NO. 321-64554 SHEET 1/1 改定 REV C

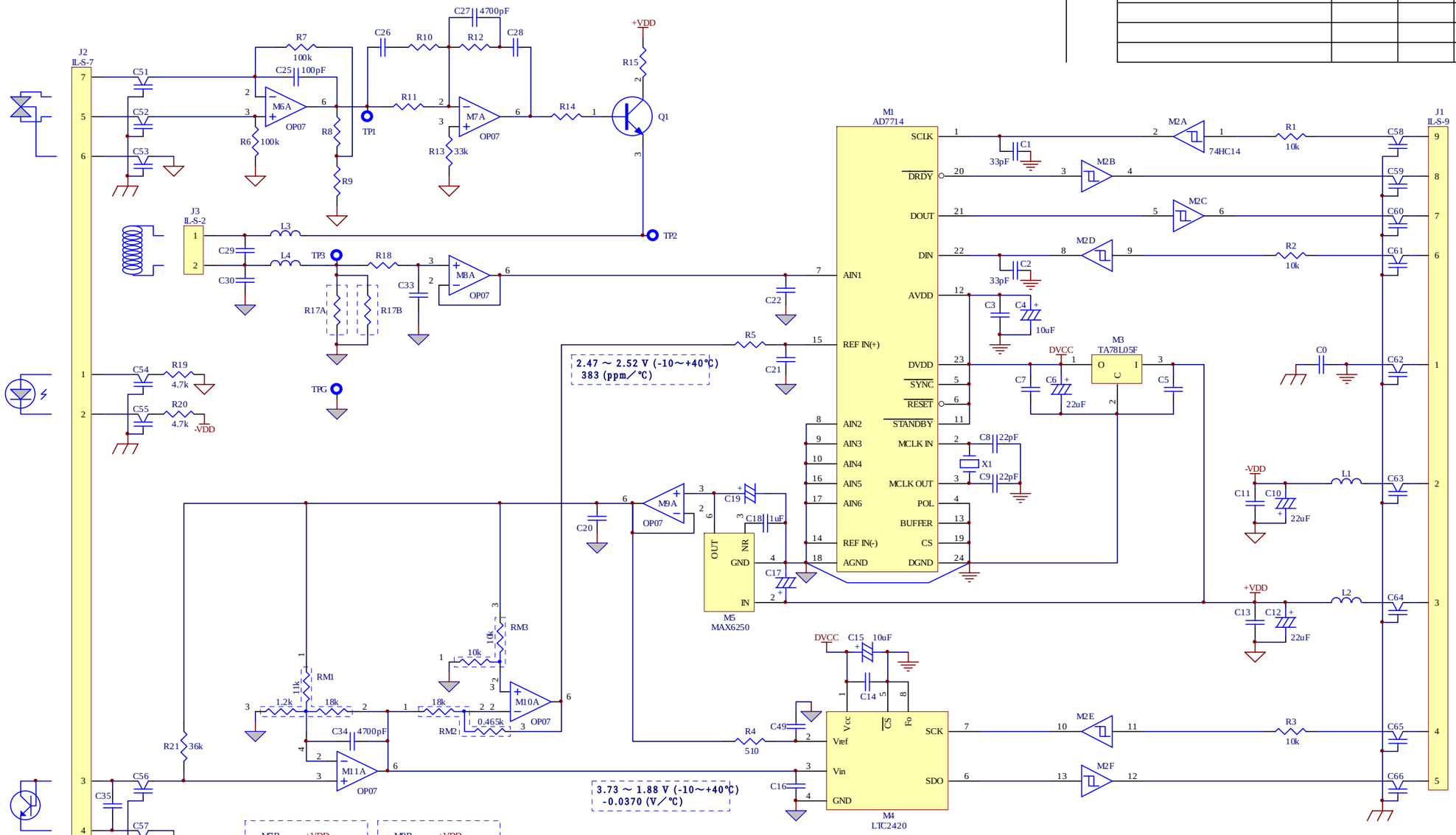
整理 NO.

図面番号 DWG NO. 321-64554

TW/TWC TX/TXC ANALOG BOARD CIRCUIT (3/3)

改定 REV	改定内容 DESCRIPTION	EC NO.	日付 DATE	担当 SIGN

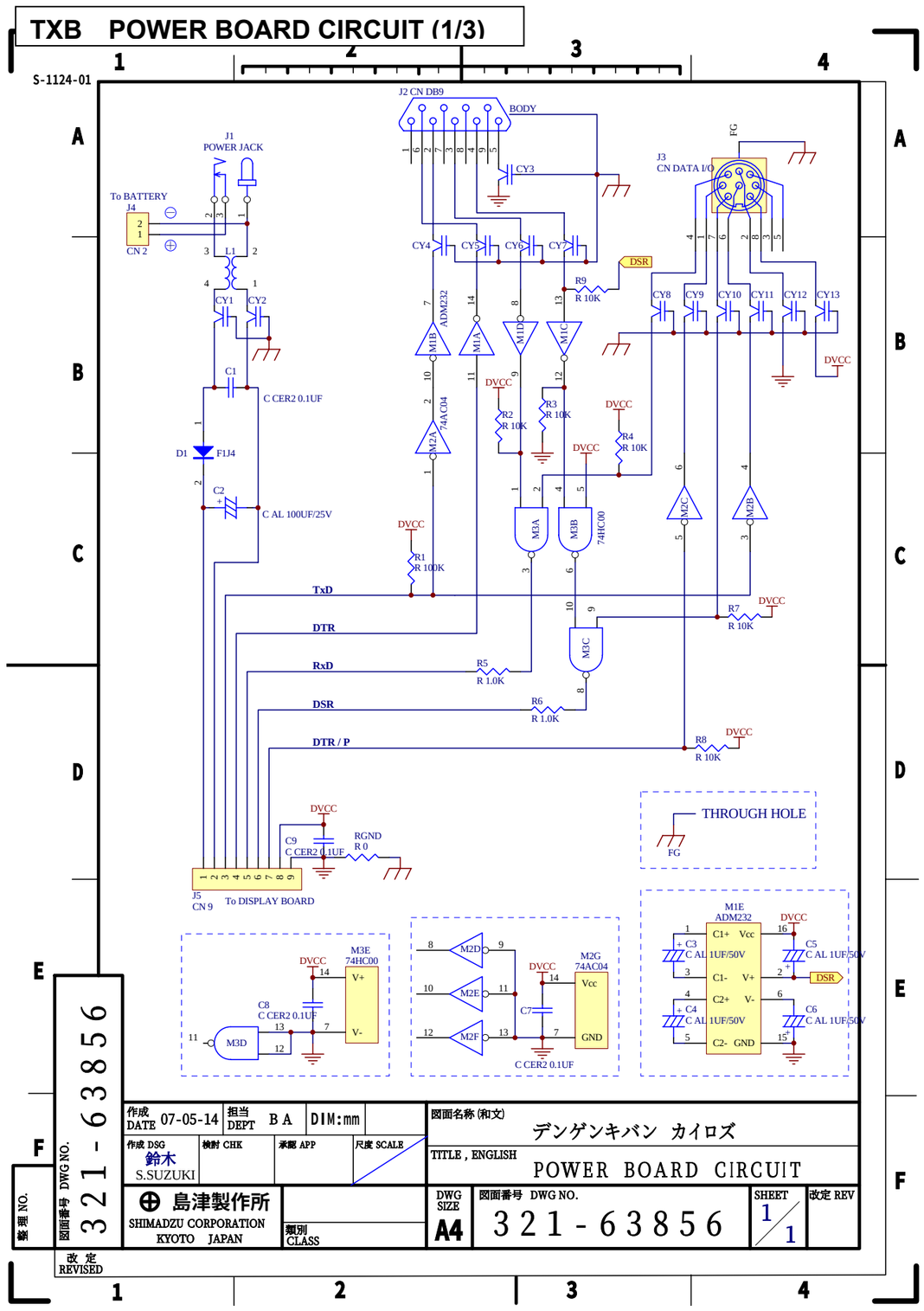
088-00703-01



作成 DATE 06-11-15	担当 DEPT B A	DIM:mm	図面名称 (和文) カイロズ, アナログキバン		
作成 DSG 友田 K.TOMODA	検討 CHK	承認 APP	尺度 SCALE	TITLE , ENGLISH CIRCUIT , ANALOG BOARD	
⊕ 島津製作所 SHIMADZU CORPORATION KYOTO JAPAN				DWG SIZE A3	図面番号 DWG NO. 3 2 1 - 6 4 5 5 7
1 M3 2 TITLE 1 M4 2 P/L					SHEET 1／1

整理 NO. | 図面番号 DWG NO. 3 2 1 - 6 4 5 5 7

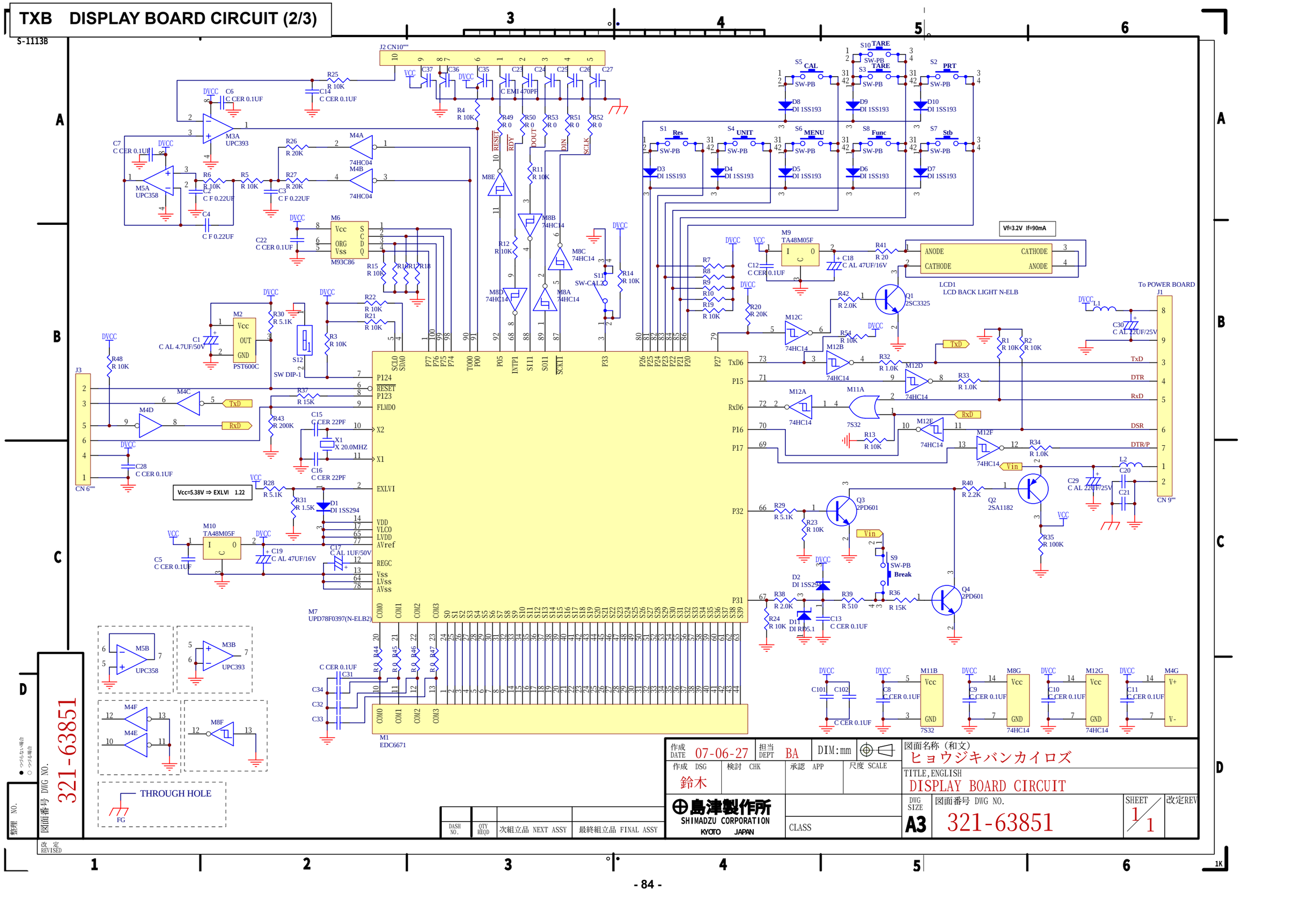
TXB POWER BOARD CIRCUIT (1/3)



作成 DATE 07-05-14	担当 DEPT B A	DIM:mm	図面名称 (和文) デンゲンキバン カイロズ
作成 DSG 鈴木 S.SUZUKI	検討 CHK	承認 APP	尺度 SCALE
TITLE , ENGLISH POWER BOARD CIRCUIT			
島津製作所 SHIMADZU CORPORATION KYOTO JAPAN	類別 CLASS	DWG SIZE A4	図面番号 DWG NO. 321-63856
SHEET 1/1	改定 REV	整理 NO.	図面番号 DWG NO. 321-63856
改定 REVISED			

TXB DISPLAY BOARD CIRCUIT (2/3)

S-1113B



作成 DATE	07-06-27	担当 DEPT	BA
作成 DSG	鈴木	検討 CHK	
承認 APP		尺度 SCALE	DIM:mm

図面名称（和文）: ヒョウジキバンカイロズ

TITLE,ENGLISH: DISPLAY BOARD CIRCUIT

島津製作所 SHIMADZU CORPORATION KYOTO JAPAN

CLASS

DWG SIZE: A3

図面番号 DWG NO.: 321-63851

SHEET: 1/1

改定REV

DASH NO.	QTY REQD	次組立品 NEXT ASSY	最終組立品 FINAL ASSY

整理 NO.

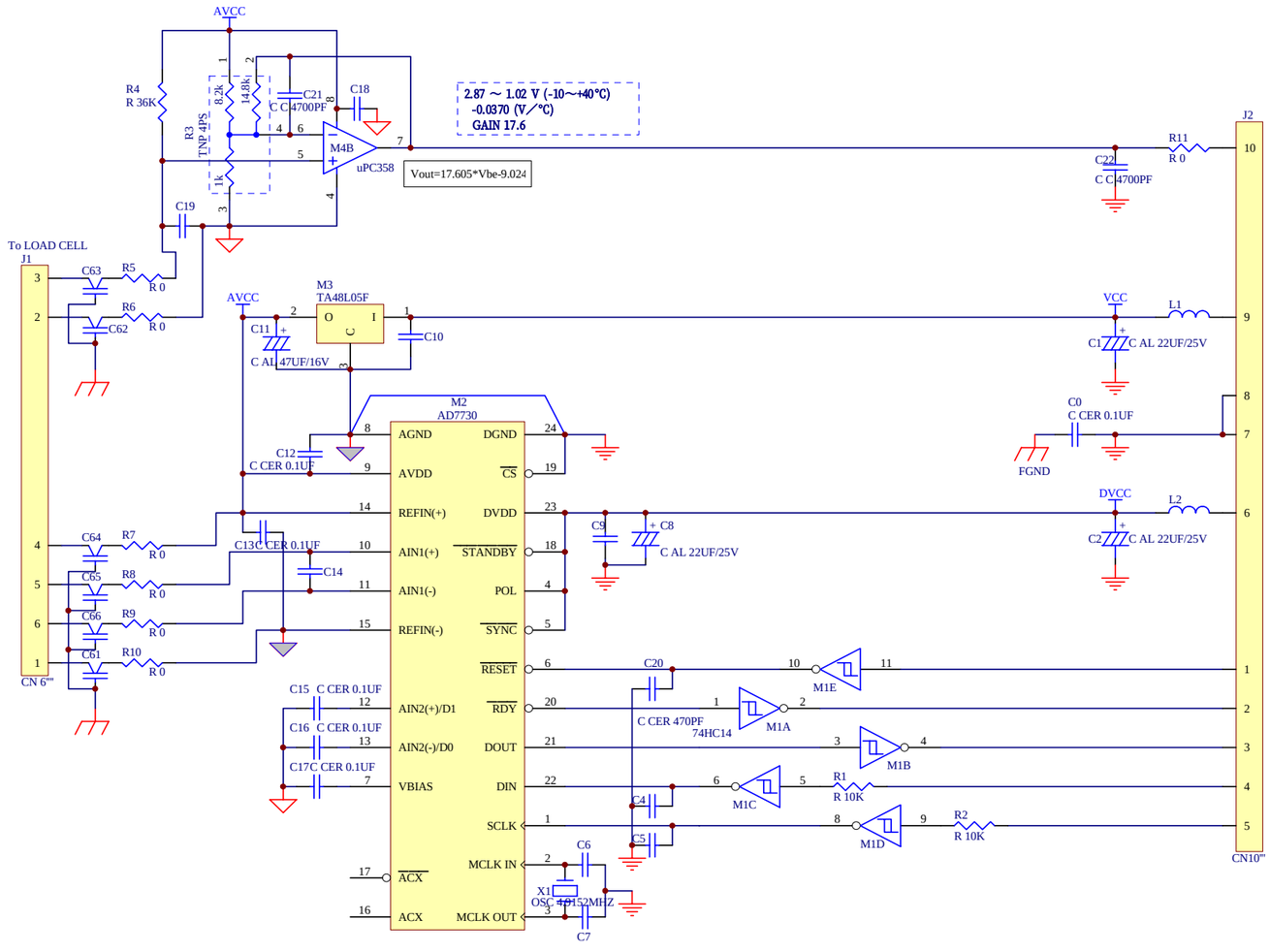
図面番号 DWG NO. 321-63851

改 定 REVISED

● つづらない場合
○ つづる場合

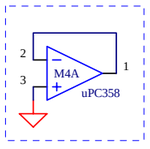
TXB ANALOG BOARD CIRCUIT (3/3)

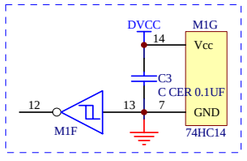
改定 REV	改定内容 DESCRIPTION	EC NO.	日付 DATE	担当 SIGN



BOARD ASSY 321-63845
BOARD 321-63847

SHIELD COVER
THROUGH HOLE
FGND





088-00703-01

整理 NO.

図面番号 DWG NO. 321-63846

作成 DATE 07-06-01	担当 DEPT B A	DIM:mm		図面名称(和文) アナログキバンカイロズ	
作成 DSG 鈴木 S.SUZUKI	検討 CHK	承認 APP	尺度 SCALE	TITLE , ENGLISH ANALOG BOARD CIRCUIT	
島津製作所 SHIMADZU CORPORATION KYOTO JAPAN				DWG SIZE A3	図面番号 DWG NO. 321-63846
				SHEET 1/1	改定 REV

1 M3 2 TITLE 1 M4 2 P/L